

THE PRACTICE
OF THE
REFEREES' COURTS,
IN REGARD TO
ENGINEERING DETAILS & ESTIMATES.

J. S. WILL.

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THE PRACTICE
OF
THE REFEREES' COURTS,

In Parliament,

IN REGARD TO

ENGINEERING DETAILS, EFFICIENCY OF WORKS,
AND ESTIMATES,

AND

WATER AND GAS BILLS;

WITH

A Chapter on Claims to Compensation.

BY

JOHN SHIRESS WILL, Esq.,

OF THE MIDDLE TEMPLE, BARRISTER-AT-LAW.

LONDON:

STEVENS AND SONS, 26, BELL YARD,
LINCOLN'S INN,
Law Booksellers and Publishers.

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PRINTED BY G. W. STEVENS,
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P R E F A C E.

THOSE concerned in the practice of the Referees' Courts, will, I trust, find this volume what it professes to be, viz., a Book of Practice for Counsel, Agents, and Engineers, and a Compendium of the past decisions of the Referees.

The task of analysing the Reports of the Referees to the House, relating, as they do, to so many different subjects, all of them of a technical nature, has been one by no means unattended with difficulty; while the compilation of a Law Book, out of materials belonging peculiarly to the department of the Railway Engineer, involved, at least, some novelty. Under these circumstances, I am encouraged to hope that these pages, the result of considerable labour, will meet with an indulgent reception.

I am conscious of the fact, that a few of the cases

cited would have been much more readily understood by the aid of the plans and sections deposited ; but these plans and sections it was, of course, impossible for me to reproduce. In the vast majority of cases, I trust that I have succeeded in stating intelligibly the points contested, and the decisions to which the Referees came. Cases previously decided are continually being cited from recollection before the Referees ; and, if I have introduced any that can only be imperfectly understood without the plans and sections, it is because I feel that it will be satisfactory, when such cases are so cited, to know what it was that the Referees really reported concerning them.

It has been my endeavour to state the facts of each case with fullness, and, as far as possible, in the Referees' own words, so as to save reference to the Supplement to the Votes of the House.

I have—not without much diffidence—to express a hope that this Work may prove of some assistance to the Engineer. It may assist him in anticipating and providing against the objections of opponents to the engineering details and efficiency of the Line he is laying out ; it may also enable him, through a familiarity with the previously decided cases, to have clearly before him, especially when under cross-examination, all the various competent devices by which the Referees

will allow particular engineering objections to be got over.

By the addition of an Index of the Bills cited, and a copious General Index, I trust that any utility this volume may otherwise possess, has been increased.

J. S. W.

4, ELM COURT, TEMPLE,

1st November, 1866.



CONTENTS.

CHAPTER I.

CONSTITUTION AND PRACTICE OF THE COURTS.

SECT.	PAGE
I. Constitution and Jurisdiction of the Courts	1
II. Rules of Procedure	3
III. Right to Begin	5
IV. Rights <i>inter se</i> of Petitioners to Begin	7
V. Course of the Enquiry, Report, &c.	7
VI. Only one counsel heard on each side	9
VII. Petitioners not allowed to go into Objections not specified in their Petition	11
VIII. Alterations and Modifications within Limits of Deviation 1. May be proposed by Promoters and by Petitioners within Limits of Deviation	12
2. Alteration in regard to Spans, Headway, &c., of Bridges and Viaducts	14
3. Alteration proposed in regard to Docks	15
4. Alteration of the position of Junctions	16
5. Where a proposed alteration involves the effecting of a Junction not originally contemplated	20
6. Alternative Lines or Routes proposed by Petitioners	21
7. More appropriate site for particular works	23
8. Diversion of a Street proposed by Petitioners	24
9. Promoters proposing Viaduct instead of Embankment	24
10. Alterations to obviate objections to Gradients, Curves, Crossings, &c.	25

SECT.		PAGE
11.	One alteration proposed proving objectionable, can Promoters suggest another	25
IX.	Extent of Limits of Deviation and of Power of altering Engineering Works	26
X.	Competing Lines	30
XI.	Favourable Report by Referees subject to a Reference to Engineers	33
XII.	Favourable Report subject to the Petitioners' consent being obtained for the proposed works	34
XIII.	Referees will not decide as to the Legality of existing works	35
XIV.	Referees will not enquire into the Legality of Promoters' claim to Ownership of Land, &c.	35
XV.	Objections in respect of works contemplated by Peti- tioners	36
XVI.	Effect on the Bill of the Referees' Decision	37
	1. Where Referees report that Estimate insufficient	37
	2. Where the Referees report that works inefficient or Engineering defective	39
	Cases where the Referees report Junctions to be impracticable or objectionable	42
	Back Shunts	42
	Reports against Facing Points on Main Lines	43
	Where Referees report that powers taken by the Bill are insufficient for the construc- tion of the proposed works	44
	Adverse Report as to Interference with Navi- gation	45
XVII.	Questions arising before Committee and referred to Referees	47
XVIII.	Jurisdiction of Consent over whole subject-matter of Bill	48

CHAPTER II.

INTERFERENCE OF PROPOSED LINE WITH THE PROPERTY, RIGHTS, ETC.,
OF OTHER LINES.

SECT.		PAGE
I.	Taking the Land of another Company	50
	1. Taking Land intended for another Company's Station	50
	2. Taking Land intended by another Company for doubling their Line	52
	3. Taking Land intended for another Company's Sidings	55
	4. What if the Opponents have long neglected to make use of the Land alleged to be required by them for Stations, Doubling their Line, Sidings, &c.	56
	5. Taking Land which another Company are authorised to take but have not yet taken	57
	6. What if the compulsory powers enabling the opposing Company to take the land have expired	57
II.	Interference with another Company's existing works	58
	1. Extent to which Interference with another Company's existing sidings will be allowed	58
	2. Destroying Points constructed for turning trains from Swinging Bridge when opened	60
	3. Crossing another Company's Line on the level	61
	4. Interference with the Station arrangements and Approaches of another Company	64
	5. Interference with the Arch of another Company	66
	6. When the Promoters' powers of deviation will be restricted	67
III.	Miscellaneous instances of Interference with other Lines	68
	1. Objection that Promoters' trains will have to stand on Petitioners' Main Line	68
	2. Destroying Points at Junctions	69
	3. Doing that which will entail expense on another Company without countervailing advantage	69
	4. Passing under Petitioners' Line in such a way as to prevent their lowering same	70

SECT.	PAGE
5. Doing that which will prevent another Company from using a line over which they have Running Powers	70
6. Cutting off communication between Petitioners' line and a Quay the traffic of which it accommodates	71
7. Imperilling another Company's line through danger arising from Slips, &c.	71
IV. What if the Interference complained of results from the Petitioners having altered the condition of their Line, &c., subsequently to deposit of plans	72
V. Interference with a Railway authorised but not yet constructed, or with a proposed Line not yet authorised	74
VI. Headway and Span of Bridges <i>over</i> other Lines—Disturbing Gradients of other Lines by such Bridges	77
VII. Headway of Bridges <i>under</i> other Lines—Disturbing Gradients of other Lines by such bridges	80
VIII. Obstruction to view of Signals at Junctions and at Stations, and to view of Line, &c.	82

CHAPTER III.

INTERFERENCE WITH CANALS.

I. Interference with Land of Canal Company	87
II. Proposed Line running for 5 miles beside Canal and for 2 miles of that distance below level of same	88
III. Interference with passage of Vessels to Canal	89
IV. Interference with Towing Paths	89
V. Headway and Span of Bridges over Canals	90
VI. Tunnels under Canals	91

CHAPTER IV.

INTERFERENCE WITH THE PROPERTY OF PRIVATE INDIVIDUALS AND PRIVATE COMPANIES.—INTERFERENCE WITH PRIVATE RAILWAYS AND TRAMWAYS.

SECT.	PAGE
I. Interference with the property of private individuals and private Companies	92
II. Interference with private Lines, Tramways, Sidings, &c.	96
1. Follows same general rule as Interference with other private property	96
2. Unnecessary or avoidable Interference with private Lines, &c.	98
3. What if the private Sidings interfered with are on Promoters' own Land	100
4. Crossing private Lines on the level	100
5. Headway, Span, Width, &c., of Bridges over and under private Lines	101
III. Accommodation Works	102
IV. Endangering Gunpowder Mills through proximity of proposed Line	104
V. Interference with the Drainage of a District.—Danger to district from floods through insufficient waterway over River	105

CHAPTER V.

JUNCTIONS.

I. Provisions of the General Act, 1863	107
II. Junctions on irreconcileable Gradients	108
III. Junctions on steep Gradients and sharp Curves.—No intervening level space for standage, &c.	111
IV. In what exceptional cases Junctions on steep gradients and sharp curves are usually allowed	118
1. Where the Junction is with a Line of the Promoters own, or worked by them, or where the proposed Line will be worked by the Line to be joined	118

SECT.	PAGE
2. Where the Signals at the point of Junction will be in the hands of the Company to be joined	120
3. Where trains already have to slow at the proposed point of Junction	121
4. Where the Lines are entirely mineral	123
V. Multiplicity of Junctions in one place	123
VI. Junctions impracticable because the two Lines not on same level at point of Junction	125
VII. Junctions with crowded Main Lines, or Crossing same on level	126
1. These are in general objectionable	126
2. But not objectionable when with Promoters own Line	128
3. Not objectionable where the Signals will be entirely under the control of the Line to be joined	130
VIII. Junction in a tunnel sanctioned	130
IX. Junction of proposed narrow gauge Line with a broad gauge Line and <i>vice versa</i>	131
X. Back Shunts when objectionable	133
XI. When objections to Junctions may be obviated by the construction of Blind Sidings	135
XII. Facing Points	136
1. Facing Points on Main Lines objectionable	136
2. Cases where Facing Points allowed, Speed of Trains being slow, or Junction being on the level	140
3. Two sets of Facing Points on a single Line "highly objectionable"	141
XIII. Objection that according to Plans no physical Junction effected	142

CHAPTER VI.

STEEP GRADIENTS AND SHARP CURVES.—UNUSUAL DIFFICULTIES IN CONSTRUCTION OF LINE.

SECT.	PAGE
I. Engineering rules in regard to Curves and Gradients	143
II. Objections to Steepness of Gradients and Sharpness of Curves	146
III. Lines of extraordinary Difficulty in Construction. Difficult Country, &c.	150
IV. Station on or near to steep Gradients	156
V. Objection that Line will be below level of adjacent River, Canal, &c.	158
VI. Gradients at Level Crossings over Roads and Streets	159

CHAPTER VII.

INTERFERENCE WITH ROADS AND STREETS.—BRIDGES UNDER AND OVER SAME.—ALTERATION OF INCLINATIONS, ETC.

I. Crossing Roads and Streets on the level	160
1. Provisions of the General Acts on this subject	160
2. Crossing Roads on the level	162
3. Crossing Streets on the level	165
4. Level Crossings over Roads and Streets allowed where near Stations	168
II. Altering Inclinations of Roads and Streets	169
1. Provisions of the General Act	169
2. Instances where powers sought in Bill to alter Inclinations of Roads and Streets	170
3. Instance where promoters omitted to seek powers in Bill to alter Inclinations of Roads and Streets	171
III. Headway, Span, Width, &c., of Bridges under and over Roads and Streets	173
IV. Screens for Turnpike Roads	177
V. Lowering Road below level of adjacent Stream	179

SECT.	PAGE
VI. Railway proposing to occupy site of Road	180
VII. Shutting up Streets.—Providing new Street in place thereof	180
VIII. Interference with Gas, Water and Drainage pipes	184
IX. Laying a Tramway in a narrow Street	185
X. Swing Bridges in crowded thoroughfares	186
XI. Improvement Bill.—Width of a proposed new Street in the Metropolis	187
XII. Proposed Station 120 feet below Street	187

CHAPTER VIII.

TIDAL AND NAVIGABLE WATERS.—WORKS IN, ON AND OVER THE SAME.—OBSTRUCTION TO NAVIGATION.—RECLAMATION BILLS.

I. Bridges or Viaducts over Tidal or Navigable Waters	189
II. Embankments across or along Tidal Waters	196
III. Tunnels under Rivers, Tidal Waters, and Canals	197
IV. Sinking Cylinders in navigable River to form Subway	199
V. Interference with Anchorage Ground	200
VI. Possible silting up of Sand, &c.	200
VII. Proposed Docks or Pier interfering with Navigation	202
VIII. Provisions of General Act of 1863, as to works in or across Tidal Waters, &c.	203
IX. Proposed Reclamation of Tidal Lands	206

CHAPTER IX.

POWERS TAKEN BY THE BILL INSUFFICIENT FOR THE CONSTRUCTION OF THE PROPOSED WORKS.

I. No provision for Stations, Sidings, Standage, &c.	208
II. No physical Junction effected with another Line which it is intended to join	211
III. No powers taken to alter or affect Gradients of Roads and Streets	212

SECT.	PAGE
IV. Objection that no Running Powers taken over another Line, in order to connect proposed Line with some other Line intended to be joined	212
V. Where construction of proposed works contingent on construction of some other works before Parliament and not yet sanctioned	214

CHAPTER X.

TUNNELS.

I. Ventilation, Gradients, Headway, Drainage, &c., of Tunnels	215
II. Alleged dangerous proximity of two Tunnels	217
III. Junctions in Tunnels	217
IV. Tunnels close to Junctions or to Stations preventing view of Signals	218
V. Tunnels under navigable Rivers and Tidal Waters	218
VI. Subway under Thames formed by sunk Cylinders	219
VII. Tunnel under Canal	219

CHAPTER XI.

DOCK BILLS.

Taking water from the same source as another Dock Company— Alleged deprivation of supply	220
Construction of Dock narrowing Waterway and increasing Velocity of Current	220
Interference with Anchorage Ground	220
Taking private Tramways, no objection in an engineering point of view	220
Causing silting up and consequent injury to Channel, &c.	220
Pier obstructing and diverting set of Tide	221
Docks as designed reported inefficient	221

	PAGE
Dock Company seeking powers to supply Shipping with Water Landing Passengers and goods by means of a Pontoon	221 222 222
Lock at entrance to Dock too small	222

CHAPTER XII.

ESTIMATES.—OBJECTIONS IN RESPECT TO PRICES AND QUANTITIES.

SECT.

I. Importance of Accuracy in Estimates, Form, &c.	223
II. Objection that Quantities understated	225
III. Junctions, Signals, Sidings, &c., not provided for in Estimate	225
IV. Objection that no provision for Stations, answered by fact that line for mineral purposes	226
V. No provision for deposit of surplus Cutting.	227
VI. Cases where promoters calculated on getting rubbish gratuitously for Earthwork	227
VII. Insufficiency of Estimate for Tunnel under River	228
VIII. No provision for expense of Dredging in order to con- struct Harbour of Refuge	229
IX. Foreshore.—Promoters assuming same to belong to them and including no sum for same in Estimate	229
X. Larger and more expensive works to be constructed than shown on Plans, but Estimate originally prepared for such larger works	230
XI. Different material to be used from that contemplated in Estimate	231
XII. Rock Cuttings.—Vague and unsatisfactory evidence as to same.—Estimate reported insufficient	231
XIII. Taking scheme as a whole Estimate sufficient, though Estimate for particular portions of works insufficient	232
XIV. Plea that portion of Line provided for by another Bill before Parliament and by a separate Estimate	234
XV. Whether necessary to deposit Estimate for the expense of laying down an additional Line upon an existing Railway	236
XVI. How Estimate, as deposited, dealt with where portion of proposed works abandoned	236

SECT.	PAGE
XVII. Evidence.—Price paid for Land in the district by other Companies proved	238
XVIII. Evidence.—Price paid for similar work in neighbourhood proved	238
XIX. Evidence.—Inclination of Slopes of Embankments of neighbouring Railways on similar soil proved	239
XX. Estimate reported sufficient for works proposed, but insufficient if Board of Trade should order Viaduct instead of solid Embankment	239
XXI. Estimates reported sufficient “with economy”	240
XXII. Expense of substituting other Roads for those to be interfered with	240
XXIII. Expense of providing other Gas and Water Pipes before interfering with existing Pipes	241

CHAPTER XIII.

ESTIMATES.—OBJECTIONS IN RESPECT OF THE OMISSION OR UNDER-ESTIMATE OF CLAIMS OF COMPENSATION.

I. Estimate insufficient, looking to amount of compensation claimable	242
II. Where private property interfered with, Petitioners should attack Estimates rather than Engineering Details	243
III. Value of Property in Towns.—Contingent and remote injury	245
IV. What if the Land has increased in value since Estimate made	248
V. What if no actual Valuation of Land, &c., made for Estimate	249
VI. Value of Land on which another Company have partially constructed works	249
VII. When Promoters taking part of House, Manufactory, &c., may be required to take whole	250
VIII. Estimate need not provide for remote contingencies in the construction of works	252

SECT.	PAGE
IX. When Promoters may be required to take whole of intersected Lands	253
X. Compensation for the temporary use of Land, Roads, &c.	254
XI. Accommodation Works	255

CHAPTER XIV.

ESTIMATES.—FOR WHAT COMPENSATION IS CLAIMABLE.

I. The subject generally	256
II. Compensation consequent on Interference with Roads and Streets	257
III. Compensation consequent on Interference with Water	262
IV. Compensation in respect of Vibration, Noise, &c.	265
V. Compensation for Danger to Cotton Mill through proximity of Railway	267
VI. In what cases Company taking part of House, Manufactory, &c., can be compelled to take whole	267
VII. Whether a Company tunnelling under may be compelled to take the whole Land and Buildings on the surface	271
VIII. Compensation in respect of Minerals under Line	273

CHAPTER XV.

WATERWORKS BILLS.

I. Standing Order 92, and its construction <i>quoad hoc</i>	274
II. Objections by Millowners and Individuals about to be deprived of their supply	276
III. Objections to the amount of proposed supply, provisions for storage, &c.	283
IV. Objections to quality of proposed supply	286
V. Objections in reference to Pressure	288
VI. Objection that preferable supply might be obtained from other sources	289

SECT		PAGE
VII.	Estimate insufficient looking to amount of Money Compensation claimable by Millowners, &c.	290
VIII.	Effect of Adverse Report by Referees	291

CHAPTER XVI.

GAS BILLS.

I.	Standing Order 93, and its construction <i>quoad hoc</i>	292
II.	Gas Bills in past Sessions	294
III.	Cases in which all questions in Gas Bills have been referred to the Referees	298

INDEX OF BILLS CITED	229
GENERAL INDEX	307

EXPLANATION OF REFERENCES.

The reference “1865, 293,” means the 293rd page of the Supplement to the Votes of the House of Commons for Session 1865 (where the Referees’ Reports are printed); and, in like manner, the figures “1866, 115” are intended to indicate the 115th page of the Supplement for the year 1866.

The letters “S. & G.” denote the published Reports of Messrs. STONE and GRAHAM.

THE
PRACTICE OF THE REFEREES' COURTS
IN REGARD TO
ENGINEERING DETAILS, ESTIMATES, &c.

CHAPTER I.

CONSTITUTION AND PRACTICE OF THE COURTS.

SECT. I.

CONSTITUTION AND JURISDICTION OF THE COURTS.

The Courts of Referees were first constituted by the Standing Orders of the House of Commons for 1865.

By Standing Order, No. 90, for 1867, it is provided :—

- (1) “That the Chairman of Ways and Means, with not less than three other persons, who shall be appointed by Mr. Speaker for such period as he shall think fit, shall be Referees of the House on Private Bills;
- (2) “That such Referees are to form one or more courts ;
- (3) “That three, at least, are to be required to constitute each court ;
- “(4) Provided that the Chairman of any second court shall be a Member of the House ;
- “(5) And provided that no such Referee, if he be a Member of the House, shall receive any salary.”
- Provisions of Standing Order.
The Members of the Courts.
- Number of Courts.
Number of Referees to form a Court.
Chairman of second Court.

JURISDICTION.

The jurisdiction of the Referees, in reference to questions of engineering and estimates, is, at present, defined by the Standing Order, No. 92, for 1867, which is as follows :—

Jurisdiction
of Referees
defined.

“The Referees shall inquire into all or any of the following matters as to which parties petitioning against any Bill pray to be heard in opposition, viz. :—

(1) “In the case of Bills for authorising the construction of works, the engineering details of the undertaking, the efficiency of the works for the proposed object, and the sufficiency of the estimate for executing the same.

(2) “In the case of Waterworks Bills, the nature and amount of the existing and the proposed source of supply, as to pressure and proposed mode of service, the quality of the water in each case, and the provisions as to storage reservoirs.

(3) “In the case of Gas Bills, the quality of the gas, the existing supply and its price, the amount of pressure, the cost of production, and the modes of testing the purity and illuminating power of the gas, and the proposed maximum price to be charged.”

Questions of
locus standi.

By Standing Order, No. 93, it is provided that questions as to the *locus standi* of petitioners are to be decided by the Referees ; and, by an arrangement among the Referees, the Chairman of Ways and Means presides in a Court of Referees exclusively for the consideration of such questions.

This branch of the Referees' jurisdiction, however, does not lie within the scope of the present treatise.

SECT. II.

RULES OF PROCEDURE.

Standing Order, No. 91, provides that :—

Provisions of Standing Order 91.

Chairman of Ways and Means to frame rules.

(1) "The practice and procedure of the Referees, their times of sitting, order of business, and forms and notices required in their proceedings, shall be prescribed by rules, to be framed by the Chairman of Ways and Means ;

(2) "Subject, however, to alteration by him as occasion may require ;

(3) "But only one counsel shall appear before such Referees in support of a Private Bill, or in support of any petition in opposition thereto, unless specially authorised by the Referees.

Only one counsel on each side.

(4) "And all such rules and alterations, when made, are to be laid on the table of the House."

In exercise of the power thus delegated to him, the Chairman of Ways and Means has prescribed the following

Rules issued.

(1) "Parties petitioning against Private Bills, in respect of any of the following matters, and who desire to be heard in opposition by their counsel or agents thereon, viz.,

"In the case of Bills of the second class, for authorising the construction of works, the engineering details of the undertaking, the efficiency of the works for the proposed object, and the sufficiency of the estimates for executing the same.

"In the case of Waterworks Bills, the nature and amount of the existing and proposed sources of supply, the pressure and proposed mode of service, the quality of the water in each case, and the provisions as to storage reservoirs.

"In the case of Gas Bills, the quality of the gas,

RULES OF PROCEDURE.

existing supply and its price, the amount of pressure, the cost of production, the modes of testing the purity and illuminating power of the gas, and the proposed maximum price to be charged.

shall endorse upon their petitions, previously to depositing the same in the Private Bill Office, a statement of the grounds (being some one or more of the grounds specified above) on which they desire to be so heard ; but it shall be competent to the Referees, if satisfied that the omission to make such indorsement in any case occurred through inadvertence or unavoidable cause, to admit the petitioners to be heard before them, upon such conditions as they may think fit.

(2) "Parties who have indorsed their petitions in manner above mentioned, may, at any time, withdraw their opposition to a Bill, so far as relates to the grounds specified in such indorsement, by depositing a requisition to that effect in the Private Bill Office.

(3) "The Clerk to the Referees shall give not less than two clear days' notice to the Clerks in the Private Bill Office, of the day on which the case of each Bill is appointed to be taken by the Referees.

(4) "The cases shall be heard in such order as the Chairman of Ways and Means shall appoint, and according to a list prepared under his direction, and kept in the office of the Clerk to the Referees.

(5) "When a Bill is called on for consideration, the agents for the petitioners against the same, shall be required to produce a certificate of appearance from the Private Bill Office, in which shall be stated the names of the petitioners, their counsel, and agents.

(6) "The sittings of the Referees shall commence at eleven o'clock in the forenoon, or at such other hour as may have been specially fixed by adjournment at a previous sitting.

(7) "All questions before the Referees shall be decided by a majority of voices, including the voice of the chairman, and, whenever the voices are equal, the chairman shall have a second or casting vote." (a)

(a) There are also three additional rules, viz., Nos. 8, 9, and 10, which have reference to the *locus standi* of petitioners.

Applications
for Hearing
before Referees
may be with-
drawn.
How that is to
be done.

Notice of
hearing to be
given through
Private Bill
Office.

Order in
which cases
shall be taken.

Certificate of
appearance
to be pro-
duced.

Hours of
meeting of
Referees.

Mode of
voting by
Referees.

SECT. III.

RIGHT TO BEGIN.

According to the rule of these Courts the opponents' Right to begin.
counsel begins ; and this rule applies to all Bills, whether Railway Bills, Waterworks Bills, or Gas Bills.

Before the Select Committee which was appointed in 1865, to inquire into the operation of the Courts of Referees, a diversity of opinion was expressed as to the expediency of this general rule ; and it was urged by some that, in Water and Gas Bills particularly, the matters for investigation are peculiarly, and in many cases exclusively, within the knowledge of the promoters ; that in Water Bills, for instance, the promoters are better able to give detailed information concerning the proposed source of supply, the quality of the water, and the proposed provisions for storage reservoirs than the opponents ; and that in Gas Bills such matters as the amount of pressure and the cost of production are exclusively within the knowledge of the promoters. In the case of the Bath Gas Bill, 1865 (see evidence before Select Committee, Q. 352), the opponents of the Bill urged reasons similar to the foregoing before the Referees ; but the Court declined to excuse the opponents from beginning.

Any hardship likely in exceptional cases to arise from the rule which the Referees have laid down is greatly diminished by the opponents being able to call the promoters' engineer as their first witness, and to examine, or rather cross-examine him on all the points which they think it expedient to raise, and for which the allegations in their petition form a sufficient basis. Where the promoters' engineer keeps out of the way, so as to avoid being called at the outset by the opponents, a Speaker's Order will be granted for his attendance. (See evidence before Select Committee, Q. 1333.)

Opinions as to
this rule.

Refusal to
depart from
the rule.

But pro-
moters' engi-
neer may be
called at
outset.

Speaker's
Order for his
attendance.

Exceptions to
the rule.

Cases have arisen, however, where the Referees have

Severn Bridge
of $2\frac{1}{2}$ miles.

allowed a departure from the rule above stated. In the *South Wales and Great Western Direct Railway Bill* (1 Stone & Graham, 8), the promoters proposed to cross the Severn by a bridge about $2\frac{1}{2}$ miles in length ; and an application was made to the Court on behalf of the petitioners, that the promoters' case should be heard first, as the sufficiency of the estimates for the bridge, which was the main feature of the line, would be questioned ; and it was impossible for the petitioners to go into that till they had more information than was given by the deposited plans. The Chairman stated that, "under the exceptional circumstances of this case, the bridge promoters would begin. . . . The viaduct formed an essential part of the scheme ; but this was an exceptional case, and that was the reason why the general practice was departed from. The promoters would be heard first on their whole case."

Forth Bridge
of 2 miles.

Soon after the *Forth Bridge Bill* (1 S. & G. 9), came before the Referees. The proposed railway would cross the Frith of Forth by a viaduct of 2 miles in length. The estimates were challenged, and an application was made on behalf of the petitioners, that the promoters' case might be taken first, on the ground that the deposited plans only gave the number of arches and the span of each ; but gave no information as to the nature of the works, or the materials to be used, or indeed any information on which the petitioners could attack the estimates. The Referees, following their decision in the last-mentioned case, required the promoters to begin.

But where
tunnel of
4278 yards
under river,
the general
rule adhered
to.

On the other hand, in the *Birkenhead and Liverpool Railway Bill* (1 S. & G. 12), by which it was proposed to construct under the Mersey a tunnel, of which 4,278 yards would be under the high water mark of the river, and there were only 15 feet of space from the rails to the crown of the tunnel, a motion was made that the promoters should be called upon to begin, and explain how they proposed to construct works of so unusual an extent, as the deposited plans did not show how that was to be done. The Court in this case declined to depart from their usual practice, and called on the petitioners to begin.

SEC. IV.

RIGHTS INTER SE OF PETITIONERS TO BEGIN.

In the *Bute Docks, Cardiff*, (No. 1) Bill (1 S. & G. 13), four separate petitions had been presented against the Bill; and the question of right to begin arose as between the several petitioners. It was stated from the bar that the rule had always been that where there were several petitions against a Bill, the senior counsel attending should be heard first; but the Referees decided to take the petitions in the order in which they were deposited in the Private Bill Office; subject, however, to any special arrangement between counsel. This rule has since invariably obtained.

Order in
which peti-
tions depo-
sited.

SECT. V.

COURSE OF THE ENQUIRY, REFEREES' REPORT, ETC.

The course of the enquiry before the Referees is as follows:—The counsel for the opponents, having the right to begin, states the case of the opponents, and it has become usual for him thereafter to call the promoters' engineer to afford such explanations, concerning engineering details and the efficiency of the works contemplated, or the data on which the deposited estimate has been made up, as the opponents may desire. This witness is then cross-examined by the counsel for the promoters, but usually only on such matters as he has been examined upon, the promoters having the right to call him afresh in the course of their own case. Thereafter, the opponents' own witnesses, to substantiate their objections to the works or estimates, are called and are cross-examined in the usual

Conduct of
the enquiry.

way. On the case of the opposition being closed, the counsel for the promoters states their case (or he may reserve his speech until the close of his evidence), recalls, where necessary, their engineer (to explain in detail matters in regard to which he has not already spoken), and calls any further evidence for the promoters; he has no right to sum up, except where he has waived his opening address. The counsel for the opponents has a right to reply.

In the *Maryport Improvement Harbour and Dock Bill*, 1866, (14 Law Times, 83), before the Referees on the question of *locus standi*, the petitioners adduced evidence, and at the close of the same the petitioners' counsel proposed to sum up the evidence. It was observed by the Referees:—"You can only be allowed to make a simple statement of the propositions on which you rely. No comment or anything in the nature of a speech, can be allowed."

By Standing Order 95 it is provided:—

(1) "So soon as the inquiry into the matters referred to them upon any bill has been completed, the Referees shall make their report upon the same to the House, stating the facts upon which their opinion is founded;

(2) "And the report shall thereupon stand referred to the Select Committee on the Bill.

(3) "No further evidence shall be taken by the committee upon any of the matters reported upon by the Referees."

Referees to report to House,

stating the facts.

Report to stand referred to Select Committee. Their decision final.

Report when made.

The Referees do not, as a rule, announce their decision in Court at the close of the enquiry. The terms of their decision are learnt only when the report to the House is made, which is usually two or three days after the enquiry.

The effect of the Referees' decision on the future conduct of the Bill, is hereafter considered. (Sect. 16.)

SECT. VI.

ONLY ONE COUNSEL HEARD ON EACH SIDE.

According to Standing Order, No. 91, "Only one counsel shall appear before such Referees in support of a Private Bill, or in support of any petition in opposition thereto, *unless specially authorised by the Referees.*" In the first session of their institution, the Referees did not possess the discretionary power since given to them by the words italicised. They, in consequence, considered the Standing Order as imperative in reference to the number of counsel ; and refused to sanction any departure from it.

One counsel
only heard.

In the *Forth Bridge Bill* (1 S. & G. 10), the whole case being about to be inquired into by the Referees under Standing Order, 94, the counsel for the promoters applied to the Court to lend him their assistance in an application to the House, to modify the Standing Order allowing only one counsel to appear, as this was a case of such magnitude that it was impossible for one counsel to conduct it properly. The Chairman intimated that the Referees considered that they were acting under the orders of the House, and that it was not for them to make any application to alter the Standing Orders.

A similar application was made to the Referees with a like result, in the case of the Severn Bridge (*The South Wales and Great Western Direct Railway Bill*). (See evidence before Select Committee, Q. 53.)

As to the expediency of so restricting the number of counsel, conflicting opinions were expressed before the Select Committee ; who, in their report, said, "The regulation which confines the number of counsel to one in each case, is much complained of by some, while it is spoken of by others as a great improvement. It is alleged, that a barrister is at times over-tasked by having to deal with many opponents, each defended by counsel ; but, on the

Recommendation of the Select Committee as to counsel.

other hand, it was represented to the Committee, that great advantage had been derived from the continued attention of the same counsel to the whole of the case before the Referees.' On the whole, your Committee recommend, that if the Court of Referees should be continued as it is, the present rule should stand, but that it should be open to parties to apply to the Court for permission to appear by more than one counsel."

In accordance with this recommendation, the proviso "unless specially authorised by the Referees," has been added to the Standing Order; so that the Referees have now the power of sanctioning the attendance of any number of counsel on either side.

In the *Maryport Improvement Harbour and Dock Bill* (27th Feb. 1866, 14 Law Times, 83), an application was made to the Referees on *locus standi*, for leave, under the Standing Order, for more than one counsel to appear on behalf of the petitioners. It was urged that the undertaking had been before Committee in a previous session, and that the petitioners were anxious to be represented by the same counsel, as being peculiarly conversant with the details of the scheme; and it was stated, that the cause was a heavy one, and the assistance of a junior counsel was desirable. The Referees ruled that there were no special grounds to induce them to depart from the ordinary rule.

More than one counsel may, however, be present.

But even in the event of the Referees declining to authorise the attendance of more than one counsel a side, there is nothing to prevent either party from having as many counsel present as they please, as in the *Bath Gas Bill*, where three counsel attended on behalf of the Bath Corporation, who opposed, although the leading counsel only was heard to address the Court and examine and cross-examine the witnesses. (a)

Leaving counsel's name blank in appearance paper.

It has also been a not unfrequent practice for parties to

(a) The leading counsel for the Corporation, in his evidence before the Select Committee on the Referees, said, "When the appearance paper was taken up, the Referees said that they could not recognise more than one counsel, but that they could not preclude others from being in the room, and offering me assistance." (*Report of Select Committee*, Q. 253.)

retain two counsel, so as to secure the attendance of one, entering the appearance in blank, and filling in the counsel's name when the case is called on. (*Evidence before Select Com. Q. 455.*)

SECT. VII.

PETITIONERS NOT ALLOWED TO GO INTO OBJECTIONS NOT SPECIFIED IN THEIR PETITION.

The petitioners will be restricted from travelling beyond the allegations in their petition. Thus, the petitioners will not be allowed to go into evidence in regard to the defects of a proposed junction, or of any other portion of the works proposed, if the objection thereto has not been stated in the petition.

Nor is it sufficient to state vaguely the petitioners' objection in the petition; some specific issue must be raised.

It is not enough for a petitioner to allege generally that a proposed line is "ill-contrived," because no distinct engineering issue, capable of being met by the promoters, is thereby raised. In the *Barnet, Hendon, Hampstead, and London Railway Bill* (1 S. & G. 117), the petitioners' allegation was as follows:—"The proposed railways are ill-contrived for the purposes they profess to effect, and your petitioners complain of the said junctions with the Great Northern Railway, not only on account of the interference with their property, but also because they are ill-selected, and will interfere with the safe and efficient management of the traffic of the Great Northern Railway." The Referees here held that an issue as to the engineering details of the undertaking was not sufficiently raised by the words of the petition—the petition did not say that the junctions were bad in an engineering sense, and it was consistent with the petition that all the petitioners complained of was the injudicious direction and course of the line.

Petitioners confined to allegations in petition.

Vagueness of objections.

Allegation that line "ill-contrived" insufficient.

Allegation
that peti-
tioners' line
“better
defined,”
insufficient.

In another case, the *Lancashire and Yorkshire, and Midland and Leeds, Bradford and Halifax Junction Bill* (1 S. & G. 3), the petition of the Great Northern Railway (who were promoting a competing line) alleged, “Your petitioners humbly submit that the works so proposed by them are better defined (*sic*) and more conducive to the public convenience than the said branch railways proposed by the Lancashire and Yorkshire Railway.” The petition prayed that the petitioners might be heard against the engineering details of the proposed lines, but did not otherwise allege any defects in the engineering details of the line proposed by the promoters. The Referees decided that they “could not hear parties upon matters not specified in the allegations in their petitions.” In the case of the *Great Northern Railway (Additional Powers) Bill* (1 S. & G. 5), against which there was a similar petition, by the Lancashire and Yorkshire Railway, very similar to the petition in the above case, the Referees also refused to hear the petitioners.

SECT. VIII.

ALTERATIONS AND MODIFICATIONS WITHIN LIMITS OF DEVIATION.

I.

May be proposed by Promoters and by Petitioners within Limits of Deviation.

It is competent to the promoters to propose, before the Referees, such alterations on and modifications of their original plans as they deem expedient, either in order to obviate the objections of petitioners, or to effect some variation of their own choice ; provided always that such alterations or modifications are capable of being effected within

the limits of deviation shown in the deposited plans. It is equally the right of petitioners to propose such alterations and modifications for the consideration of the Referees, whether on the ground of public expediency, or as obviating special injury to themselves; provided, in like manner, that the same are capable of being effected within the promoters' limits of deviation. And the reason of this restriction within those limits is, that under the Bill the promoters would have no power to construct works beyond the limits of deviation. Where alterations are suggested by petitioners, it is the practice of the Referees to report upon the practicability, efficiency, cost, and comparative merit of the same, as well as on the practicability, &c., of the original design of the promoters. As, however, the Referees do not possess any power to insert clauses, they cannot themselves sanction such alterations, and can only report on the expediency of the same, leaving the Committee on the Bill to decide which of the two methods (assuming both to be practicable) ought to be adopted, regard being had to the public advantage.

The alteration proposed must be capable of being wholly carried out within the limits of deviation. In the *Vale of Crickhowell Railway (Western Extension) Bill*, 1865, 368, the objection was taken that the proposed railways would destroy the sidings by which the Brecon and Merthyr Railway obtained access to their engine-shed, turn-tables, and goods-yard. The Referees reported, "The sidings in question will be destroyed, and it was suggested that certain sidings can be provided in lieu thereof; but those laid down in the plan produced to the Referees are not wholly within the limits of deviation contained in the deposited plans, and consequently cannot be effected within the powers contained in the present Bill."

Sidings (in
lieu of others
destroyed)
proposed
beyond
limits, &c.

II.

Alteration in regard to Spans, Headway, &c., of Bridges and Viaducts.

Alteration in headway of Severn viaduct.

In the *South Wales and Great Western Direct Railway Bill*, 1865, 353, it was proposed to carry the line across the Severn by a viaduct $2\frac{1}{4}$ miles in length, which would be constructed upon 87 piers, consisting of iron cylinders, ranging from 10 to 20 feet in diameter, and 178 in number ; and the number of arches would be 71. With regard to the headway to be afforded by these arches, the promoters proposed, before the Referees, some alteration on the heights shown on the deposited plans. The maximum headway there shown was 95 feet above high water at spring tides ; but, before the Referees, the promoters proposed to give an increased elevation of 5 feet, making the maximum headway 100 feet.

Increasing headway and span.

Alteration in spans of bridge, in number, height, and width.

And in the *London and North Western and Midland Counties Coal Fields Railway Bill*, 1866, 195, the promoters (see more fully *post*) proposed to raise the headway of a certain bridge and to increase the span of a certain other bridge.

In the *North British Railway (Tay Bridge) Bill*, 1866, 246, it appeared from the deposited plans that the proposed bridge across the Tay was intended to be formed with two spans of 300 feet each, 53 spans of 200 feet, and 38 spans of 100 feet. But the Board of Trade having objected to this mode of construction, the promoters proposed before the Referees to build the bridge with side spans of 120 feet each and 18 spans, each 200 feet wide, with a height of from 102 to 110 feet in the clear from high water. The Referees, in reporting that the final adjustment of the spans should be left to the decision of the Board of Trade, under the 14th section of the Railways Clauses Act, 1863, added, "It will also be desirable that the promoters shall have power so to

deviate vertically from their levels, as shown, as to enable them to construct all the 200 feet spans of a height of not less than 110 feet above high water, if so required."

III.

Alteration proposed in regard to Docks.

In the *Alexandra (Newport) Docks Bill*, 1865, 292, the promoters were allowed to make extensive alterations in the dimensions of certain docks; the Referees reported that the docks proposed to be constructed would be of larger dimensions than they were shown to be upon the plan deposited, and the inner dock was intended to be lengthened 50 feet; and that the sum estimated would be sufficient for the execution of the proposed enlarged works, which were all within the limits of deviation; and that the estimate lodged had been prepared for the enlarged works.

Alteration in dimensions of docks.

In the *South Lancashire Railways and Dock Bill*, 1865, 273, it having been objected that the dimensions of the lock at the entrance of the proposed dock, as shown on the deposited plans, were too small for the purposes of the dock, the promoters replied that they could construct what was shown on said plans as a tide entrance in the form of a lock of sufficient dimensions (200 feet by 50) by removing the site of the dock 100 feet further back from the river. The Referees reported "that the lock as shown is too small; but that probably the additional accommodation required could be gained by such removal, and that the same could be effected upon the land contained within the limits of deviation."

Removing site of dock 100 feet.

IV.

Alteration of the Position of Junctions.

Altering
position of
junctions.

It is competent to both promoters and petitioners to propose before the Referees the removal of a point of junction from the position indicated on the deposited plans to some other situation. Objections to junctions are among the most frequent of all objections. Where the proposed junctions are really defective in an engineering point of view, the petitioners' objections are in most cases obviated, within the limits of deviation and the powers of the general Acts, by removing the point of junction from its position on the plans to some other situation, or by altering the gradient of the proposed line. A few instances are here noticed. In the *Havant, Hambleton, and Droxford Railway Bill*, 1865, 45, a certain junction having been objected to, the promoters proved "that the limits of deviation at the junction were large enough to admit of the junction being made lower down, on a gradient of 1 in 80 of the petitioners' line," &c. In the *Barnet, Hendon, and Midland Junction Railway Bill*, 1866, 205, a junction having been objected to by the Edgware, Highgate, and London Railway, on the ground that it was made south of, and at a greater distance than necessary from, the Finchley Station, the promoters replied "that the junction could be effected within the limits of deviation nearer to the station," and the Referees reported favourably. In the *Bromyard and Hereford Railway Bill*, 1866, 88, several proposed junctions having been objected to, on the ground of incompatibility of gradient and other grounds, the Referees reported that "Evidence was given to show that the necessary alterations can be made within the limits of deviation."

Committee to
decide if
alteration to
be allowed.

As the Referees have, however, no power to authorise the removal of a point of junction, they can only report on the practicability and engineering merits of the proposed

alteration, the Committee on the Bill being thus left to decide thereon.

In the *Burton-on-Trent and Nottingham Railway Bill*, 1865, 217, the Midland Railway had objected to a junction which railway No. 1, at its termination in Nottingham, would form with the North Western Railway, on the ground that, as shown in the plans, it would be effected upon a girder bridge, carrying the Great Northern over the Midland with a span of 90 feet, and that to effect such a junction it would be necessary to cut through one of the side girders of the said bridge. In reply, the promoters stated that the junction was not intended to be effected upon the bridge, but at the south end thereof. The Referees reported that "If the junction be so effected, there will not be any engineering objection; but as to whether the promoters can depart from the point of junction upon the deposited plan is not for the Referees to decide, being matter of law or clause." In the *South Lancashire Railway and Dock Bill*, 1865, 273, the London and North Western objected to a proposed junction which line No. 3 (commencing by a junction with line No. 1) would form with their North Union Line. The proposed junction line would be on a gradient of 1 in 88 descending towards the latter line, which is there very much crowded with traffic, and without any level space intervening between the said gradient and the point of junction. The Referees considered this mode of junction, under the circumstances, highly objectionable in an engineering point of view. The promoters replied that the requisite level space could be procured by moving the point of junction with the proposed Line No. 1 further back upon that line; but the Referees reported that they "cannot decide whether or not the promoters have such powers to alter the point of junction with their own line No. 1." And in the *Launceston, Bodmin, and Wadebridge Junction Railway Bill*, 1865, 375, the Cornwall Railway Company complained that the construction of a junction at Truro would prevent the widening of their viaduct, so as to allow their line, now a

single line, to be doubled. To obviate this objection it was suggested that a junction could be effected within the limits of deviation by moving the point of junction 2 chains further to the west of the point shown on the deposited plans, and shifting the proposed line so far to the north as to permit the viaduct to be doubled. This could be physically effected, but it would amount to a lengthening of the proposed line to the extent of 2 chains, and it would also shift the point of junction from that shown on the deposited plans. The Referees report bears :—"The Referees are of opinion that it is extremely doubtful whether this alteration can be legally executed without the consent of the Cornwall Railway Company ; but they are not competent to determine this matter."

Removal of
points of junc-
tion, suggested
by petitioners.

In the following instances the proposal that the position of a junction should be altered came from the petitioners :—In the *Wrexham and Minera Railway Bill*, 1865, 263, it was objected to Railway No. 1, that a junction was made with the Minera Branch with a gradient of 1 in 50 at the foot of a gradient of 1 in 37 on that line, at a point which would involve a great amount of shunting of the traffic coming from the Frose Collieries and the Brymbo Ironworks, and that a much better junction might have been made at the end of the Frose Branch, whereby the traffic would be carried in a direct line, and the shunting avoided. The promoters replied that the proposed junction was fixed with a view to the accommodation of the local traffic on both sides of the valley, and to the placing of a station so as to avoid interference with the traffic on the Wheatsheaf and Minera line ; and that if placed at the point suggested by the petitioners, the junction would, in addition to this interference, involve a gradient of 1 in 25 and carry the lines to a higher level, whereas it was so laid down as to pass over the lowest summit between Wrexham and the Fridd Branch. The Referees reported that the position of the junction in question was "well placed, having regard to the nature of the country, and well chosen to effect the objects of the promoters."

In the *Newport and Usk Railway Bill*, 1865, 299, the Monmouthshire Railway Company objected that a proposed junction with their Eastern Valleys Line ought to be effected near to the existing Newport Station, instead of at the point proposed, which was about 48 chains distant therefrom. The Referees reported that it would seem better if the junction were effected nearer to the station ; but that this was a matter to be determined upon consideration of the amount of traffic rather than as an engineering question.

And in the *Maidstone and Ashford Railway Bill*, 1866, 65, the South Eastern objected to Railway No. 1, which was about 6 furlongs in length, that the junction with their line might have been much nearer to their Maidstone station, by which the construction of nearly half a mile of line would have been rendered unnecessary. It was intended that a separate station should be erected at the town for the traffic of the proposed lines. The Referees reported that if there was no object beyond the transfer of the traffic from one line to the other, upon which matter alone evidence was given, the junction would be preferable at the point nearer to the petitioners' station.

Where the objections of the petitioners cannot be obviated within the limits of deviation and the powers of the general Acts, the Referees have no alternative but to report unfavourably of the proposed junctions. See the *Glasgow City Suburban and Harbour Railway Bill*, 1865, 186, where the Referees reported that, "the junction with the petitioners' railway could not be constructed under the powers of the Bill ;" the *Swansea and Aberystwith Junction Railway Bill*, 1865, 419, where they reported that "the junction of the proposed railway with the Swansea and Aberystwith Railway cannot be made according to the deposited plans ;" the *Llantrisart and Taff Vale Junction Railway Bill*, 1865, 422, where they reported in reference to a certain junction, that "the mode proposed by the promoters to obviate this difficulty cannot, in the opinion of the Referees, be effected under the powers of

Where objections cannot be obviated within limits of deviation.

the Bill ; " and the *Tottenham and Hampstead Junction Railway (New Lines) Bill*, 1865, 128, where a junction having been objected to as impracticable, on account of the difference of gradients, the Referees reported " the evidence given to this effect, in the opinion of the Referees, fully sustained the objection. No other mode of effecting a junction, consistent with the provisions of the Bill and the powers of the Company, was shown to the Referees to be practicable."

V.

Where a proposed alteration involves the effecting of a junction not originally contemplated.

Junction
proposed not
before con-
templated.

It is quite competent to either party to suggest such alterations, if they can be effected within the limits of deviation. In order to effect a junction not before contemplated, the authority of the Committee on the Bill is necessary ; the Referees, however, will consider and report on the practicability and expediency thereof. Thus, in the *Midland Railway (Settle to Carlisle) Bill*, 1866, 213, the North Eastern objected that Railway, No. 3, would cross their line upon the level near Carlisle Station ; and the London and North Western objected that Railways, Nos. 3 and 4, would run through and cut up their goods station at Carlisle, and also obstruct the approach to the same through Crown Street. To obviate these objections, the promoters proposed to effect a junction of No. 3 with the South Eastern (with their consent) at a certain point, and to abandon the rest of No. 3 and the entire of No. 4. The Referees reported that this junction could be effected within the limits of deviation, and would remedy the injuries complained of ; and added, " it will be for the Committee on the Bill to determine whether they will allow such alterations."

See also the *Manchester, Sheffield, and Lincolnshire*

Railway (Central Station and Lines) Bill, 1866, 261, (p. 25), where the promoters proposed that their line No. 3, should be constructed only up to a certain point, and that a junction should there be effected with an authorised Midland Line.

VI.

Alternative Lines or Routes proposed by Petitioners.

As regards alternative lines suggested without the limits of deviation, it is quite clear that the Referees will not allow petitioners to go into that question, and will refuse altogether to entertain the suggestion. In the Lancashire and Yorkshire Railway (Additional powers), 1 S. & G. 122, the petitioners proposed to go into the question as to whether the promoters "could not take a better course by going on the other side of a brook, which was without their limits of deviation." The Referees decided, "We cannot go into that. They could not go on the other side of the brook under the powers of this Bill ; and we can only report on the merits of the works as proposed by the Bill before us." And, again, in the *Bristol and North Somerset Railway Southern Extension Bill*, 1866, 323, the Great Western and the East Somerset Railway Companies objected that the lines proposed were defective in many of their engineering details, but the petitioners, having proposed to give evidence of the comparative merits of these railways with certain other lines not before Parliament, or within the limits of deviation, the Referees declined to hear them except on the engineering details of the lines proposed by the Bill ;" and the petitioners thereupon withdrew (a).

Alternative
lines or routes
outside limits
of deviation.

(a) See *North British Railway (Lasswade Branches) Bill*, 1865, 174, where, on the petition of the Caledonian Railway, the Referees reported that "better gradients could have been obtained by taking a more direct line, and that the promoters state that they were induced to take the line proposed in order to meet the wants of the population along the line." See also *Trowse Road Bill, postea*, where the alternative road suggested by the opponents was not wholly within the limits of deviation.

The Select Committee appointed to enquire into the operation of the Courts of Referees say, in their report, "It has been suggested by some of the witnesses that the Referees should have the power of considering the engineering statistics of alternative lines of railway which has hitherto been exercised by Committees on opposed Bills;" and they recommended (Report, p. v.) the adoption of this suggestion. No Standing Order has been issued to carry the recommendation into effect.

Alternative
lines or routes
proposed
within limits
of deviation.

Within the limits of deviation, however, alternative lines or routes have frequently been considered by the Referees. Thus, in the *Callander and Oban Railway Bill*, 1865, 176, it was objected by a landowner that another and better line, less injurious to the petitioner's estate, and within the limits of deviation, could be made. The gradients and curves on this proposed deviation were equal to those on the proposed line; but such deviation would require 27,000 additional yards of cutting, a tunnel or covered cutting 300 yards in length, with an average depth of 30 feet, with other works. The Referees reported that the proposed deviation could be made; but that, unless a strong case be made out, no sufficient reasons in an engineering point of view existed for the making of such deviation, the additional cost of which was stated by the petitioners to be about £5,500, whilst the promoters stated that it would amount to £12,000. In the *Trowse Road Bill*, 1865, 41, the promoters having proposed to make a new piece of road 1,090 yards in length, the petitioners alleged that a road, 462 yards only in length, might be constructed "almost entirely within the proposed limits of deviation," which would better effect the object of the promoters; and sections and plans were produced to show the practicability of the shorter road. The Referees reported that the same class of heavy engineering works were

As to comparing the engineering merits of proposed line with other lines in existence in the locality, see *Severn Junction Railway Bill*, 1865, 361, where the Referees reported, "In regard to the allegation of the bad gradients of their line, the promoters showed that, comparing them with those of other lines in the South Wales district, they were superior."

common to both the proposed roads; that the cost of making the shorter road would be less, but subject to additions for compensation; that the heavy earthworks of the shorter line would require the construction of retaining walls at the back of some cottage property; and that part of the bridge by which it would cross the railway would be immediately over the passenger platform of the station. (a)

VII.

More appropriate Site for particular Works.

It is also the settled practice of the Courts that no suggestion that a more fitting site might have been chosen, beyond the limits of deviation, for particular works, can be entertained. That is a question for the consideration of the Committee on the Bill. The province of the Referees is merely to decide whether the particular works may be erected within the particular limits chosen by the promoters, without reference to the comparative eligibility of other sites. Thus, in the *Bute Docks, Cardiff (No. 1) Bill* (1 S. & G. 18), the Penarth Dock Company alleged in their petition that, "the site selected for the additional works now proposed is far inferior in many essential features to that selected by your petitioners; and apart from the question of comparison between these two sites, there are other sites in the neighbourhood, and upon the property of the undertakers, preferable to that now selected by them." The Referees ruled, "We have no power to deal with such

Better site for
works beyond
limits of
deviation.

(a) It is to be observed, that in this case the petitioners produced plans and sections of the suggested shorter road. As the proposed road could not be constructed entirely within the limits of deviation, it is not clear that this case will be followed as a precedent. See the decision of the Court in a subsequent case, the *Vale of Crickhowell Railway (Western Extension) Bill*, 1865, 368, where the promoters, having suggested that certain sidings might be constructed in lieu of those destroyed belonging to the petitioners, the Referees reported "that those laid down in the plan produced to the Referees, are not wholly within the limits of deviation contained in the deposited plans, and consequently cannot be effected within the powers contained in the present Bill."

a question as this. We cannot give the promoters a right to place their dock in any particular spot. All we can do is to say whether it can be placed on the site proposed As we have no power to insert clauses, we cannot enquire as to the capabilities of different sites."

VIII.

Diversion of a Street proposed by Petitioners.

Petitioners
proposing
diversion of a
street.

In the *Rhymney Railway Bill*, 1866, 216, it was suggested on behalf of the Corporation of Cardiff that it would be desirable to divert that part of Gaol Street which lay between certain points from the east side of the Rhymney Railway to the west side of the said railway. The Referees reported—"Should the Committee upon this Bill think proper to direct this diversion, there will be no engineering objection thereto."

IX.

Promoters proposing Viaduct in place of Embankment.

In the *Craven Junction Railway Bill*, 1866, 110, the line, as shown in the deposited plan, was entirely on embankment where not under the surface; and the promoters proposed before the Referees to substitute a viaduct for 800 feet of embankment. The Referees reported that as no viaduct had been shown on the plans deposited, they were of opinion that the promoters, under the powers contained in their Bill, were not at liberty to construct anything but an embankment. (a)

(a) The promoters would have such a power under the general Act of 1845, sect. 14, if authorised by the certificate of the Board of Trade, see p. 28. In this case the Referees also reported the estimate insufficient, and therefore the Committee did not enter on consideration of the Bill.

X.

Alterations to obviate Objections to Gradients, Curves, Crossings, &c.

See numerous instances noticed hereafter, particularly in Chapter II., VI., and VII.

XI.

One alteration proposed proving objectionable, can Promoters suggest another?

In the *Manchester, Sheffield, and Lincolnshire Railway (Central Station and Lines) Bill*, 1866, 261, the question arose whether the promoters, after having fixed upon a definite alteration before the Referees, which turned out to be impracticable, could be permitted to submit a further alteration. It appeared that, by agreement with the Midland Railway Company, the promoters had arranged that Railway No. 3 should be constructed only up to a point 1 mile $7\frac{1}{2}$ chains from the commencement thereof; that a junction should there be effected with the authorised Midland Line; and that the remainder of No. 3 should be abandoned. It was admitted that at the point in question Railway No. 3 would be 3 feet 3 inches above the level of the authorised Midland Line. The Referees considered that this difference would render the junction at the point proposed impracticable, and that in such case the railway would not be efficient for the objects proposed. It was thereupon alleged by the promoters that at a point 8 chains further from the commencement of No. 3 than the

point selected for the junction with the Midland, the two lines were upon the same level, and that a junction could be there effected ; but the Referees "declined to entertain this question, upon the ground that the promoters, having fixed upon a definite alteration which had been proved to be impracticable, they could not be permitted to submit a further alteration." When, however, the Bill came before the Committee, they remitted it back to the Referees (under Standing Order 97) with the following question :— "The committee desire to be informed by the Referees whether, consistently with efficient engineering, it is practicable within the limits of deviation, to effect a junction at the point 8 chains further from the commencement of line No. 3 than the point of junction at present proposed ; and, if so, whether the estimate, as amended, will suffice." (See 1866, 297.)

SECT. IX.

EXTENT OF LIMITS OF DEVIATION AND OF POWER OF
ALTERING ENGINEERING WORKS.

In consequence of the rule that the Referees will not entertain any alteration or amendment which cannot be effected within the limits of deviation, and of the fact that the objections of petitioners are usually obviated by some alteration within those limits, it becomes of material consequence to have in view, in the course of any enquiry before the Referees, what are the limits of deviation, vertical as well as lateral, to which the promoters are entitled ; for these vary according to the position and the nature of the work contemplated. In like manner it is important to keep in view what are the promoters' powers of deviation from, or alteration of, engineering works shown on the plans, such as the constructing of a viaduct in place of an

embankment, as represented on the deposited plans, and *vice versa*. These limits and powers are regulated by the sections of the General Acts which follow :—

RAILWAYS CLAUSES CONSOLIDATION ACT, 1845,
(8 VICT. c. 20).

“ Sect. XI. In making the railway, it shall not be lawful for the Company to deviate *from the levels* of the railway, as referred to the common datum line described in the section approved of by Parliament and as marked in the same, to any extent exceeding in any place *five feet*, or, in passing through a *town*, village, street, or land continuously built upon, *two feet*, without the previous consent, in writing, of the owners and occupiers of the land in which such deviation is intended to be made, or, in case any street or public highway shall be affected by such deviation, then the same shall not be made without the like consent of the trustees or commissioners having the control of such street or public highway, or, if there be no such trustees or commissioners, without the like consent of two or more justices of the peace, in petty sessions assembled for that purpose, and acting for the district in which such street or public highway may be situated, or, without the like consent of the commissioners of any public sewers, or the proprietors of any canal, navigation, gas works, or water works affected by such deviation ; provided always that it shall be lawful for the company to deviate from the said levels to a further extent, without such consent as aforesaid, by lowering solid embankments or viaducts, provided that the requisite height of headway, as prescribed by Act of Parliament, be left for roads, streets, or canals passing under the same. . . .”

Sect. XII. This section provides for public notice being given previous to making such greater deviations, and for owners of adjoining lands appealing to the board of trade against such deviations.

“ Sect. XIII. Where in any place it is intended to carry the railway on an arch or arches or other viaduct, as marked on the said plan or section, the same shall be

Company not to deviate from levels described in section more than five feet, or in towns, &c. two feet, without consent of owners, &c.

Public notice to be given previous to making greater deviations.

Viaducts, tunnels, &c. to be made as marked on deposited plans.

made accordingly ; and where a tunnel is marked on the said plan or section, as intended to be made at any place, the same shall be made accordingly, unless the owners, lessees, and occupiers of the land in which such tunnel is intended to be made shall consent that the same shall not be so made."

Limiting deviation from works in plan.

Inclination or gradients of Railway.

"Sect. XIV. It shall not be lawful for the company to deviate from or alter the gradients, curves, tunnels, or other engineering works described in the said plan or section, except within the following limits, and under the following conditions ; that is to say—

"Subject to the above provisions in regard to altering levels, it shall be lawful for the company to *diminish the inclination or gradients* of the railway to any extent, and to *increase* the said inclination or gradients as follows ; that is to say, in gradients of an inclination not exceeding one in a hundred to any extent not exceeding ten feet per mile, or to any further extent which shall be certified by the Board of Trade to be consistent with the public safety, and not prejudicial to the public interest ; and in gradients of or exceeding the inclination of one in a hundred to any extent not exceeding three feet per mile, or to any further extent which shall be so certified by the Board of Trade as aforesaid.

Radius of curves may be diminished.

"It shall be lawful for the company to diminish the radius of any curve described in the said plan to any extent which shall leave a radius of not less than half a mile, or to any further extent authorised by such certificate as aforesaid from the Board of Trade.

Tunnels may be made instead of cuttings, And viaducts instead of embankments.

"It shall be lawful for the company to make a tunnel, not marked on the said plan or section, instead of a cutting, or a viaduct instead of a solid embankment (*a*), if authorised by such certificate as aforesaid from the Board of Trade."

See also Sect. IV. of Railways Clauses Act, 1863.

Limits of deviation from line marked on plans.

"Sect. XV. It shall be lawful for the company to

(*a*) As to the substitution of other engineering works for arches, tunnels, or viaducts, see Act of 1863, *infra*.

deviate from the line delineated on the plans so deposited, provided that no such deviation shall extend to a greater distance than the limits of deviation delineated upon the said plans, nor to a greater extent in passing through a town, village, or lands continuously built upon than ten yards, or elsewhere to a greater extent than one hundred yards from the said line, and that the railway by means of such deviation be not made to extend into the lands of any person, whether owner, lessee, or occupier, whose name is not mentioned in the books of reference, without the previous consent, in writing, of such person, unless the name of such person shall have been omitted by mistake, and the fact that such omission proceeded from mistake shall have been certified in manner herein or in the special Act provided for in cases of unintentional errors in the said books of reference."

Derivation not to extend into lands of persons not mentioned in book of reference.

(*As to deviation of railway skirting tidal waters, see p. 30.*)

RAILWAYS CLAUSES ACT, 1863 (26 & 27 VICT. c. 92).

"Sect. IV. Notwithstanding anything in the said Railways Clauses Consolidation Acts, respectively contained, the company, in the construction of the railway may deviate from the line or level of any arch, tunnel, or viaduct described in the deposited plans or sections so as the deviation be made within the limits of deviation shown on those plans, and subject to the limitations contained in sections eleven, twelve, and fifteen of those acts respectively, and so as the nature of the work described be not altered,—and may also substitute any engineering work not shown on the deposited plans or sections for an arch, tunnel, or viaduct, as shown thereon; (*a*) provided that every such substitution be authorised by a certificate of the Board of Trade; and the Board of Trade may grant such certificate in case it appears to them, on due enquiry, that the company has acted in the matter with good faith, and that the owners, lessees, and occupiers of the lands in which the substitution is intended to be made consent

Power to alter engineering works.

Deviation from level of arch, tunnel, or viaduct.

*May substitute other engineering work for arch, tunnel, or viaduct.
Provided authority of Board of Trade obtained.*

(*a*) As to the substitution of viaduct for embankment, see Act of 1845, *supra*, p. 28.

thereto, and, also, that the safety and convenience of the public will not be diminished thereby.

“ Provided that nothing in the present section shall affect any power given to the company or to the board of trade, by section eleven, fourteen, or fifteen, of the last-mentioned Acts respectively.”

*Prohibition of
derivation of
Railway
skirting tidal
waters without
consent of
Board of
Trade.*

“ Sect. XVII. Where the company is authorised by the special act to construct a railway, skirting a public navigable tidal river or channel, the company shall not make any deviation of the railway from the continuous centre line thereof marked on the plan deposited by them at the Board of Trade, even within the limits of deviation shown on that plan, in such manner as to diminish the navigable space, without the previous consent of the Board of Trade or otherwise, than in such manner as is expressly authorised by the Board of Trade.

“ If any deviation is made in contravention of the present section, the Board of Trade may abate and remove the work in the construction whereof the deviation is made, or any part thereof, and restore the site thereof to its former condition, at the expense of the company ; and the amount of such expense shall be a debt due from the company to the crown, and be recoverable accordingly with costs, or the same may be recovered, with costs, as a penalty is recoverable from the Company.

SECT. X.

COMPETING LINES.

The referees have no power to contrast and compare competing lines. The Select Committee in 1865 reported that it had been suggested by some of the witnesses before them that the Referees “should express their opinion of the comparative engineering merits of competing lines,” and they recommended the adoption of that suggestion (*Report*, p. 5) ; but no Standing Order was issued to carry this

recommendation into effect. It is the practice of the courts to examine into the merits of each line separately, and to report upon each separately. Usually the competing Bills are put in the Court List together, and come on for hearing the one immediately after the other; so that the reports on the two Bills may go to the House together.(a) (*See Evidence before the Select Committee, Q. 1224.*) It is for the Committee on the Bills to form their own conclusion as to the comparative superiority, in an engineering point of view, as well as in other respects, of the one line over the other.

Such was the course adopted by the Referees in the competitions (for the whole or part of the respective distances) between the following bills, viz.:—

1. The *East and West Junction Railway Bill*, 1865, 66, with the *Bedford, Northampton, and Weedon Railway Bill*, 1865, 67.
2. The *Crofthead and Kilmarnock Extension Railway Bill*, 1865, 77, with the *Glasgow and South Western (Kilmarnock Direct) Bill*, 1865, 78.
3. The *Glasgow (City) Union Railway Bill*, 1865, 105, with the *Caledonian Railway (Glasgow South Side Railways, &c.) Bill*, 1865, 106.
4. The *North British (Lasswade, &c. Branches) Bill* 1865, 174, with the *Caledonian Railway (Balerno and Penicuik Branches) Bill*, 1865, 175.
5. The *Wolverhampton and Bridgnorth Railway Bill*, 1865, 234, with the *Central Wales and Staffordshire Junction Railways Bill*, 1865, 215.
6. The *North of England Union Railway Bill*, 1865, 235, with the *East and West Yorkshire Union Railway Bill*, 1865, 237.
7. The *South Lancashire Railways, &c. Bill*, 1865, 273, with the *Lancashire Union Railways Bill*, 1865, 276.
8. The *Oymore Valley Railway (No. 2) Bill*, 1866, 152,

(a) Although competing Bills are usually put out together, this is a mere matter of convenience; and there is no reason why one Bill should be unduly delayed on account of the other, especially where the lines only partially compete. See instances Nos. 5 and 11 in the list, *infra*.

with the *Llantrissart and Taff Vale Junction Railway Bill*, 1866, 153.

9. The *Edgware, Highgate, and London Railway Bill*, 1866, 193, with the *Great Northern (Potter's Bar, Barnet, and Hendon) Bill*, 1866, 194, and the *Barnet, Hendon, and Midland Junction Railway Bill*, 1866, 205.

10. The *Swansea and Clydach Railway Bill*, 1866, 263, with a branch proposed by the *Swansea Vale Railway*.

11. The *Greenock and Ayrshire Railway Bill*, 1866, 287, with the *Caledonian Railway (Greenock and Gourock Extensions) Bill*, 1866, 109.

Different kinds of competition between proposed lines.

Competition between proposed lines is of three kinds:—

(1.) Where the lines run between the same places, but by different routes; as in Nos. 3, 6, 9, 10, and 11, *supra*; and in the *Deal and Dover Bills, infra*.

(2.) Where they not only run between the same places, but the same ground is proposed to be occupied by each, of which No. 8, *supra*, is an example.

(3.) Where the competition is partial—for part only of the line or lines proposed to be constructed; instances of which are Nos. 1, 2, 4, 5, and 7, *supra*.

The *Deal and Dover Bills*.

Although it is now settled that the Referees will not undertake to compare and contrast competing lines, yet one case occurred (it was one of the first that came before the Referees on the institution of the courts), where the Referees reported on the two Bills in one report, in which they entered into a comparison of the proposed lines, and expressed the conclusion to which they had arrived in regard to the superiority of the one over the other. This was the case of the *Deal and Dover, and Dover, Deal, and Sandwich Railway Bills* (1865, 54) which were both promoted for the purpose of effecting a connection from Dover to Deal and Sandwich. The Referees reported, “The engineering upon the Deal and Dover Line is less favourable as to gradients and curves than upon the Dover, Deal, and Sandwich; but it appears to be the best which can be had, having regard to the fact that the London, Chatham, and Dover Railway, from which it branches off, lies in a deep

valley. These gradients and curves are not objectionable. The distance from Dover to Deal by the Deal and Dover Line is much shorter than that by the Dover, Deal, and Sandwich, viz., 9 miles 47 chains, instead of 15 miles 20 chains, while the distance to Sandwich does not materially differ. Upon all the facts adduced before them, the Referees are of opinion that the Deal and Dover Line is better calculated to effect the objects proposed by both Bills. There is no engineering obstacle to either line."

SECT. XI.

FAVOURABLE REPORT BY REFEREES SUBJECT TO A REFERENCE TO ENGINEERS.

In two cases where the Referees were satisfied that the objections of petitioners were capable of being obviated by some modification on the plans within the limits of deviation, they have reported in favour of the Bill, leaving the details of the proposed alteration or modification to be settled by engineers. Thus, in the *Great Western Railway (Further Powers) Bill*, 1866, 233, the Cambrian Railways Company, having opposed certain junctions, it was agreed between the parties that the promoters should form the same at such points within the limits of deviation as should be agreed upon between the engineers on either side, or in case of difference on their part as shall be determined by an umpire. The Referees reported, that, "subject to this proviso," the works were efficient in an engineering point of view. And in the *Louth and Lincoln Railway Bill*, 1866, 234, where the River Witham Drainage Commissioners objected that by certain bridges in the proposed railway to be erected over the River Witham and the South Delph, the waterway would be so diminished as to interfere seriously with the drainage of the district, it was

agreed between the parties that the accommodation required by the petitioners in respect of the drainage should be referred for settlement to their respective engineers and an umpire. The Referees reported, that, "subject to this proviso," the works were efficient in an engineering point of view.

SECT. XII.

FAVOURABLE REPORT SUBJECT TO THE PETITIONERS' CONSENT BEING OBTAINED FOR THE PROPOSED WORKS.

In certain instances, where the Referees entertained an unfavourable view of proposed interference with the rights and property of others (not being mere individual rights for which money compensation may be obtained) the Referees have reported that the proposed works should only be sanctioned subject to the petitioners' consent being obtained thereto. Thus, in the *West Bromwich and Walsall Railway Bill*, 1866, 217, where the promoters, in order to effect a junction with another line, proposed to cut through six sets of sidings of the London and North Western, the Referees considered the proposed line defective in an engineering point of view, as laid out; but the promoters represented that it could be so altered within the limits of deviation as to effect the proposed junction without interfering with the proposed sidings. The Referees reported that it was doubtful whether this could be effected, and that, in their opinion, "the effecting of the said junction ought to be made dependent upon the consent of the London and North Western Railway Company." And in the *Ryde Station and Railway Bill*, 1866, 399, the Referees reported, "It will also be necessary that the promoters should be restrained from taking any part of the Victoria basin, dock, or pier, without the consent of the owners thereof." See also the *North British Railway*

(*Glasgow Branches*) Bill, 1866, 221, post, where the Referees reported, that "the promoters should be so restricted as to prevent them from deviating for more than the width necessary for the construction of one-half their railway from their centre line, as shown on the deposited plan, in the direction of the Glasgow Union Railway, without the consent of the petitioners."

SECT. XIII.

REFEREES WILL NOT DECIDE AS TO THE LEGALITY OF EXISTING WORKS.

For the purposes of the enquiry before the Referees, existing works or buildings are taken to be legally in their present position. Thus, in the *Ogmore Valley Railways* (No 1) Bill, 1865, 420, where the Llantrissart and Taff Vale Railway objected that certain sidings of theirs would be injured, and the promoters replied that these sidings were not legally authorised, and ought not to be there, the Referees reported, "In regard to the legality of the sidings laid down at the point of junction on the Mwyndy Branch, the Referees express no opinion ; but they consider the manner in which the Line No. 5 proposes to meet them as objectionable in an engineering point of view."

SECT. XIV.

REFEREES WILL NOT ENQUIRE INTO THE LEGALITY OF PROMOTERS' CLAIM TO OWNERSHIP OF LAND, ETC.

In illustration of this principle, see the *Bute Docks, Cardiff* (No. 1) Bill, 1865, 305, in which the proposed works would occupy a portion of the foreshore of the

Cardiff Flats to the extent of 112 acres. In the estimate, it had been assumed that the foreshore was the property of the Marquis of Bute (on whose behalf this Bill was promoted), and consequently no sum was provided for the acquisition of land. The Referees reported that they were "not in a position to form any opinion as to whether the said foreshore is or is not the property of the Marquis of Bute."

SECT. XV.

OBJECTIONS IN RESPECT OF WORKS CONTEMPLATED BY PETITIONERS.

The Referees have in certain cases entertained objections in respect of interference with or damage to works, sidings, buildings, &c., not actually in existence, but which are in contemplation. Thus, if the promoters proposed to cross the petitioners' line or sidings by a bridge, the span of which would be so narrow as to prevent the promoters from afterwards doubling their line or increasing the number of their sidings, the Referees will take care that the span is increased to the necessary extent. As to preventing the doubling of another Company's line, see the *Okehampton Railway Bill*, p. 52; and the *Launceston, Bodmin, and Wadebridge Junction Railway Bill*, p. 53; as to interference with contemplated approach to another Company's station, see *Crystal Palace New Railways Bill*, p. 65; as to preventing the contemplated lowering of another Company's line, see *Bromyard and Hereford Railway Bill*, p. 70; as to preventing the contemplated extension of another Company's siding accommodation, see *West Bromwich and Walsall Railway Bill*, p. 56; and as to preventing contemplated widening of a street, see *Manchester, Sheffield, and Lincolnshire Railway (Central Station and Lines) Bill*, 1866, 297, where

the Referees reported, "Should Railway No. 3 be sanctioned, provision should be made that no obstruction should be offered to the widening of Watson Street to a breadth of 60 feet as contemplated."

SECT. XVI.

EFFECT ON THE BILL OF THE REFEREES' DECISION.

It is provided by Standing Order 95, that "No further evidence shall be taken by the Committee upon any of the matters reported upon by the Referees." And it is further provided by Standing Order 96, that "In case the Referees shall report with reference to any Bill, that the estimate deposited in respect thereof is insufficient, or that the engineering is inefficient for the proposed object, the Bill shall not be further proceeded with, unless the House shall otherwise order."

No further evidence to be taken.

When Bill not to be proceeded with, if report adverse.

I.

Where the Referees report that Estimate insufficient.

Of the manner in which the Committee on the Bill will deal with the same, when the estimate has been reported insufficient, the following cases are instances:—In the *Greenock Railway Bill*, 1865, 233, where the Referees had reported that the estimate was insufficient, the Committee on the Bill reported, "That in consequence of the said report, the Committee did not proceed to examine further the allegations contained in the preamble of the Bill, and had determined to report that the same had not been proved to their satisfaction." In the *North Wales and*

Committee will report preamble not proved.

Birkenhead and Liverpool Railway Bill, 1866, 106, the Referees reported that the works were "inefficient, and the estimate insufficient." The Committee reported, 1866, 131, that the Referees having reported that the estimate was insufficient, they had not proceeded with the consideration of the same. And in the *East London Railway (South Western Extension) Bill*, 1866, 185, the Committee on the Bill reported "the Referees on private Bills having reported that the estimate in respect to the said Bill is insufficient, the Committee had not proceeded with the consideration of the Bill."

Bills withdrawn in consequence of adverse report.

In many cases the Bill has been withdrawn from the Committee, as in the *South Lancashire Railways and Dock Bill*, 1865, 340, in which the Referees having reported that the estimates were insufficient, the Committee on the Bill reported that the parties promoting the same "had stated to the Committee that it was not their intention to proceed with the same." Like reports made in the *Garth Quarry Railways Bill*, 1865, 398; and in the *Edinburgh and Glasgow Railway (No. 3) Bill*, 1865, 457.

Where private individual to supply funds.

Even where the funds for the execution or works are to come out of the private purse of the promoter himself, yet if the estimate has been reported insufficient, the Committee will not proceed with the Bill. Thus, in the *Bute Docks, Cardiff, No. 1, Bill*, the estimate having been reported insufficient (1865, 305), it was urged before the Committee that the funds for the execution of the works were not to be raised as in the case of a company's capital, but were to be supplied from the private resources of the promoter; that the insufficiency of the estimate was therefore not of material consequence; and that in such a case the Referees' report was not intended to be final (a); the Committee declined to proceed with the Bill, and their report (1865, 437), after adverting to the Referees' report, runs—"That, in consequence of the said report, the Committee did not further examine into the allegations contained in the

(a) The authority for these facts will be found in the *Evidence before Select Committee*, Q. 302.

preamble of the Bill, and had determined to report that the same had not been proved to their satisfaction."

Where the Referees report that the estimate for a particular Bill is insufficient, and the promoters abandon a portion of the line, so as to render the amount of the estimate adequate for the remaining portion, the Committee on the Bill even then will not proceed with it. Thus, in the *East and Junction Railway Bill*, which was a line from Blisworth, on the London and North Western, by Northampton to Bedford, the Referees had reported the estimate insufficient—"sufficient provision not having been made for the purchase of valuable property in the town of Northampton, and for contingencies" (1865, 66), the promoters proposed before the Committee to abandon that part of the line from Blisworth to Northampton; but the Committee refused to proceed with the Bill, the Referees not having stated by how much the estimate was deficient. The promoters then moved the Committee to refer the Bill back to the Referees, but this motion was not granted. (a)

What if promoters abandon part of scheme.

II.

Where the Referees report that Works inefficient or Engineering defective.

It has been found difficult in a number of cases to avoid further opening up, before the Committee, the topics reported on by the Referees. On this subject it was observed, before the Select Committee of 1865, by the Chairman of Ways and Means:—"There have been cases which I have heard of, in which, under one pretence or form or another, the questions which have been gone into before the Referees have been gone into again before the Committee under some different name. For instance,

(a) For the authority for these facts, see *Evidence before the Select Committee*, Q. 299.

where the engineering has been investigated by the Referees, and reported upon, it has been gone into again before the Committee under the name of traffic, or under the form of how it would affect some other railway. (*Evidence of Mr. Dodson*, Q. 1408.)

And it was also stated by a Chairman of Committees, Mr. Arthur Mills, that, "There has been a great deal of argument or attempted argument on the part of counsel to introduce matters which have been argued and dealt with before the Referees, and questions have constantly arisen as to whether it is competent for counsel to go into points of engineering." (Q. 1,492.) "I think that in all the instances within my recollection the Committee have adhered strictly to the rule of not allowing any evidence to be given to prove or disprove facts found by the Referees. I have strictly adhered to that rule." (Q. 1,498.)

It is proposed here to state, from an examination of the reports of the Committees, the result of certain of the Bills against which the Referees reported on engineering grounds. The information derivable from the reports of the Committees is necessarily imperfect as to the mode in which the engineering objection was dealt with; and in many cases these reports make no mention whatever of the report of the Referees. It will be observed that, notwithstanding unfavourable reports from the Referees, Bills have frequently passed the Committee. In such cases the promoters probably abandoned the objectionable portion of the works (as where several distinct lines were proposed by the Bill), or undertook to effect some alteration in their objectionable plan (into the engineering details of which the Committee have power to enquire), or came to some arrangement with the opponents.

Works
"inefficient."

Bill aban-
doned.

In the *Brecon and Merthyr Tydfil Junction Railway (Northern Lines) Bill*, the Referees (1866, 223) reported that the works were "inefficient in an engineering point of view." The Committee on the Bill reported (1866, 397) that the promoters had stated it was not their intention to proceed with the same.

In the *Ely and Ogmore Valleys Junction Railway Bill*, the Referees reported, (1865, 423) "The Referees consider the proposed railway objectionable in an engineering point of view, and that the works are not efficient for the object proposed." The Committee on the Bill reported (1866, 471) that the promoters had stated to the Committee that it was not their intention to proceed with the Bill.

Engineering
"objection-
able."
Works "not
efficient."
Bill aban-
doned.

In the *Perth General Railway Station Bill*, the Referees reported (1865, 180) that trains coming from the north would have to stand on the Scottish North Eastern main line before entering the proposed line No. 2, and so block the main line, and that this would be an engineering defect. The Committee reported (1865, 438) that the promoters had stated it was not their intention to proceed with the Bill. In the *North British Railway (Carlisle Citadel Station Branch) Bill*, where the Referees (1865, 297) reported a similar objection, the Committee (1865, 490) passed the Bill with amendments.

"Engineering
defect."
Bill aban-
doned.
Engineering
defect.
Bill passed.

In the *Caledonian Railway (Glasgow South Side Railways, &c.) Bill*, the Referees had reported (1865, 107) "that the works would not be so efficient for the object proposed as in the interest of the public should be required." The report of the Committee on the Bill bears that "they had examined the allegations contained in the preamble of the Bill, but the same had not been proved to their satisfaction" (1865, 205).

Works not so
efficient as
should be
required.
Preamble
examined
into, not
proved.

In the *Mold and Denbigh Junction Railway (Extensions) Bill*, the Referees reported (1865, 264) that a certain interference with the London and North Western at Mold "would cause some inconvenience to the public;" that "as regards the construction of the line, sufficient care had not been taken to ascertain accurately the nature of the soil on which the works are proposed to be constructed;" that a certain junction at Wrexham was "very objectionable, and is a defect in an engineering point of view." The Committee (1865, 341) passed the Bill with amendments, making no allusion in their report to the report of the

Referees. The Bill proposed to construct four lines, and the above objections applied only to No. 1.

Cases where the Referees have reported junctions to be impracticable or objectionable.—In the *Poole and Bournemouth Railway Bill*, the Referees (1865, 53) reported that a certain junction “was bad in an engineering point of view.” The Committee (1865, 84) passed the Bill, but amended it by striking out the objectionable portion. In the *Tottenham and Hampstead Junction Railway (New Lines) Bill*, the Referees (1865, 128) reported that a certain junction was impracticable, and that “no other mode of effecting a junction consistent with the provisions of the Bill and the powers of the Company was shown to them to be practicable.” The Committee (1865, 232) passed the Bill, and it does not appear how the objection was dealt with. But as the Committee have ample powers to sanction alteration of works, the fact that a particular junction is objectionable does not necessarily prove fatal to the Bill.

Back shunts.—The same observation may be made in reference to back shunts or the non-formation of a particular junction in certain cases. Thus, in the *Perth General Railway Station, Scottish Central, &c., Railway Companies Bill*, the Referees (1865, 179) reported that Railway No. 2, in not effecting any junction with the lines from the north, would be defective in an engineering point of view, “as trains coming from the north will have to make a back shunt upon Line No. 1, which is intended to be the new main line.” The Committee (1865, 382) passed the Bill with amendments. But in the *Chipping, Norton, Banbury, and East and West Junction Railway Bill*, where the Referees (1865, 195) reported that the effecting of a certain junction would involve a back shunt of 52 chains up an incline of 1 in 100, and that this, in their opinion, was an engineering defect, and also that the estimate was inadequate, the Committee on the Bill reported (1865, 301) that it appeared by the Referees’ Report “that the estimate was insufficient for

the proposed undertaking, and that there was an engineering defect ;" and that in consequence they did not examine the allegations contained in the preamble, and had determined to report that the same had not been proved to their satisfaction.

Reports against Facing Points on Main Lines.—The Referees reported against a facing on a main line in the *Surrey and Sussex Junction Railway Bill* (1865, 75); the Committee passed the Bill with amendments (1865, 184). In the *Swansea and Aberystwith Junction Railway Bill*, the Referees reported (1865, 419) that a certain junction would involve two sets of facing points on a single line, and that this would be "highly objectionable." The Committee passed the Bill with amendments (1865, 501). But, in the *Llantrissart and Taff Vale Junction Railway Bill*, where the Referees (1865, 422) reported that certain junctions, according to the deposited plans, could not be effected without facing points (see ch. v), the Committee on the Bill reported (1865, 471), "That it appeared by the Referees' report that the junctions, according to the deposited plans, could not be effected without the insertion of facing points, which the Referees consider would be objectionable in an engineering point of view. That the mode proposed by the promoters to obviate this difficulty cannot, in the opinion of the Referees, be effected under the powers of the Bill. That in consequence of the said report the Committee did not further examine the allegations contained in the preamble, and had determined to report that the same had not been proved to their satisfaction." And in the *Wood Green, Winchmore Hill, and Enfield Railway Bill*, in which the Referees reported (1865, 108) that "the introduction of facing points on the main line of the Great Eastern in the way proposed is very undesirable, and only to be allowed in case there are very strong reasons for effecting a junction with both the main lines at this station," the report of the Committee on the Bill (1865, 149) bears that the promoters had stated that it was not their intention to proceed with the Bill.

Where Referees report that powers taken by Bill are insufficient for the construction of the proposed works.—In the *North Surrey Railway Bill*, by which it was proposed to construct a line 2 miles 16 chains long, 2090 yards of which would be in tunnel, the Referees had reported (1865, 110) that “No ventilating shafts are intended to be made, nor can they be constructed. Considering the length and height of this tunnel, it is very doubtful whether the ventilation in it will be sufficient. No land has been provided at either end for stations, nor are any powers taken to run into any stations in any other line ; and, in this respect, the engineering details are, in the opinion of the Referees, deficient,” and had concluded their report thus, “Subject to the foregoing observations, there are no engineering obstacles to the execution of the proposed works ; and the question arose before the Committee on the Bill whether the Referees’ report was sufficiently definite to prevent the Bill being proceeded with. (See *Evidence before Select Committee*, Q. 1364—5.) The report of the Committee on the Bill (1865, 171) bears “that it appeared by the said report that the Referees are of opinion that the engineering details are insufficient for the proposed undertaking. That in consequence of the said report, the Committee had determined not to examine further the allegations contained in the preamble of the Bill, and to report that the same had not been proved to their satisfaction.” In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, the Referees reported, “it has been admitted that no provision has been made for providing station land or buildings at the termini of the said railways, nor at any intermediate points along said lines, nor has any provision been made for sidings at any of the proposed junctions, and the Referees are of opinion that without these several matters being provided the intended works will not be efficient for their proposed object.” The Committee on the Bill reported (1865, 347), that, in consequence, they had not examined further the allegations in the preamble, and had determined to report that the

same had not been proved. In the *South Lancashire Railways and Dock Bill* the Referees reported (1865, 273) that the estimates were insufficient, and that "no provision had been made for providing station land or buildings, nor had any provision been made for sidings at any of the proposed junctions or at the dock ; and the Referees are of opinion that, without these several matters being provided, the intended works will not be efficient for their proposed object." The Committee reported (1865, 340) that the promoters had stated that it was not their intention to proceed with the Bill. In the *Hornsey and Kingsland Junction Railway Bill*, the Referees (1865, 91) reported that no station is provided at a point of junction with another line, nor were any powers taken by the Bill to run into any station upon that line, and that for these reasons they considered the engineering was defective, and the estimate insufficient. The Committee's report (1865, 126) bears that the promoters had stated it was not their intention to proceed with the Bill.

Adverse Report as to interference with Navigation.—The effect of the Referees' decision in reference to interference with navigation is open to some uncertainty. A Bill might interfere with navigation, and yet it might be expedient for the public benefit that it should be passed ; and it has been urged that the interests of navigation should give place, in certain cases, to public advantage on land. (*See Evidence before Select Committee, Q. 239.*)

In the *Dee and Mersey Junction Railway Bill*, the Committee on the Bill reported (1865, 319), "That it appeared by the said reports that it was proposed by the Bill to carry a railway over the river Dee by a viaduct, which the Referees were of opinion could be constructed as proposed for the sum estimated, and that it would be efficient for the object proposed, and that the channel under the said drawbridge might probably be maintained ; but that the effect of such works upon the sands must be very uncertain, and that the Referees were further of

opinion that, in consequence of the strength of the tide at the site of the proposed bridge, and the short period during which vessels could pass through the same, there would be a serious obstruction to the navigation of the river Dee, accompanied with some danger. That, in consequence of the said report of the Referees, the Committee did not further examine the allegations contained in the preamble of the Bill, and had determined to report that the same had not been proved to their satisfaction."

In the *Whitehaven and Furness Junction Railway Bill*, where it was proposed to cross the Duddon Estuary upon a solid embankment of $2\frac{3}{4}$ miles, with only 350 yards of open viaduct, and it was objected that this would cause the sand to silt up above the embankment, and would so diminish the area of the tidal basin, and eventually injure certain channels, and the promoters admitted that some silting up would take place, the Referees reported that "as the amount and effect of such silting must be very doubtful, they are of opinion that the engineering works will be defective, unless the Board of Trade be empowered to require that an open viaduct may be substituted for so much of the said solid embankment as they may think requisite. The estimate is sufficient for the works as proposed, and some margin has been provided for contingencies; but if an open viaduct should have to be substituted for a large portion of the embankment, the sum estimated would be insufficient to defray the increased cost." (1865, 80). The Committee on the Bill passed the preamble, and in their report do not allude to the report of the Referees. For what passed before the Committee, see *Evidence before Select Committee, Q. 239, et seq.* The whole question of interference with the navigation was opened up of new. (Q. 242).

In the following cases, where it was proposed to construct opening bridges, the Referees reported that the proposed openings were insufficient, and so would interfere with the navigation; but the Committee on the Bills passed the preambles, and in their reports do not make any reference

to the Referees' reports, the necessary enlargement of spans having been provided for, viz. :

Fareham and Netley Railway Bill, 1865, 72, and 161.

Furness Railway Bill, 1865, 79, and 130.

SECT. XVII.

QUESTIONS ARISING BEFORE COMMITTEE AND REFERRED TO REFEREES.

By Standing Order, No. 97, "The Select Committee to which any Bill has been referred, may, subject to the approval of the Chairman of Ways and Means, refer any question arising in the course of their enquiry, which they may deem suitable to be so referred, to the Referees for their decision, such question to be stated in writing and signed by the Chairman of the Committee. The Referees, so soon as their enquiry has been completed, to return the question, with their decision certified thereon, to the Chairman."

Committees have, in a number of cases, availed themselves of the provisions of this Standing Order, and in the Session, 1866, five such remits were made.

Under this Standing Order the Committees have power so to refer "any question . . . which they may deem suitable to be so referred." They may, therefore, refer questions as to estimates, as well as questions in regard to engineering details and efficiency of works.

It is to be observed that the question so arising before the Committee, is "to be stated in writing and signed by the Chairman of the Committee." The following may be taken as a form :—

"The Committee desire to be informed by the Referees whether, consistently with efficient engineering, it is

JURISDICTION OVER WHOLE SUBJECT-MATTER.

practicable within the limits of deviation, to effect a junction at the point 8 chains further from the commencement of Line No. 3, than the point of junction at present proposed ; and, if so, whether the estimate, as amended, will suffice.

(Signed) BROOK W. BRIDGES, Chairman.

Manchester, Sheffield, and Lincolnshire Railway (Central Station and Lines) Bill, 1866, 297.

It is also to be observed, that it is entirely optional with the Committee to refer such questions to the Referees. Committees still have power themselves to enquire into the engineering details of such questions, and they have also power to enquire into the engineering details of alternative lines suggested by petitioners, beyond the limits of deviation. As to the practice of Committees on this subject see *Evidence before the Select Committee*, pp. 168-9. (*Evidence of Mr. Arthur Mills, M.P.*)

SECT. XVIII.

JURISDICTION OF CONSENT OVER WHOLE SUBJECT-MATTER
OF BILL.

It is provided by Standing Order, 94, that " In case the promoters and opponents of any Bill shall agree that all the questions in issue between them upon such Bill shall be referred to the Referees, it shall be competent to the Referees to inquire into the whole subject-matter of the Bill, and to report their opinion thereon to the House ; and, in case they shall report that such Bill ought to be proceeded with, the same shall, unless the House shall otherwise order, be referred to the Committee on unopposed Bills, and shall be treated as an unopposed Bill."

Parties have availed themselves of the provisions of this Standing Order in the following instances :—

In the *Neath New Gas Bill*, 1866, 316, all the questions in issue between the promoters and opponents were, in like manner, referred to the Referees, who reported, "that, subject to certain proposed amendments made in and annexed to the Bill, which the Referees recommend should be made therein, they are of opinion that the said bill ought to be proceeded with."

And in the *Worksop and Shireoaks Gas Bill*, 1866, 317, in which all the questions in issue were also referred to the Referees, they reported that "this Bill ought not to be proceeded with, the opponents (an existing Company), undertaking to reduce the price of gas to 4s. per 1000 feet from 1st January next."

CHAPTER II.

INTERFERENCE OF PROPOSED LINE WITH THE PROPERTY, RIGHTS, ETC., OF OTHER LINES.

SECT. I.

TAKING THE LAND OF ANOTHER COMPANY.

It is an objection in an engineering point of view, if the promoters propose to take for their line land which has been acquired by another company, and of which that company propose to make use for the doubling of their line, for sidings, for stations, or for other purposes connected with their undertaking.

I.

Taking Land intended for another Company's Station.

In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, the Great Northern complained that it was proposed to take land of theirs which was essential to the accommodation and working of their traffic. They had acquired a piece of land about $5\frac{1}{2}$ acres in extent, which they were preparing, by raising the surface 16 feet, for an extension of their goods-station. Railway No. 1, as laid

down upon the plan, would pass through the centre of this land, upon the present surface of the ground, and so cut the land into two parts, as well as occupy a considerable portion of the ground. To obviate the objection, the promoters proposed, at the option of the petitioners, either to carry their railway in a covered cutting through the said land, without altering the surface thereof as raised (which they could do by slightly depressing the proposed level of their rails), or to deviate their railway so as to pass close along the side of the canal, and thus avoid severing this parcel of land. The Referees reported that either of those propositions could be carried out ; and that, in that event, there would not be any engineering obstacle, so far as the Great Northern were concerned.

And in the *Watford and Edgware Junction Railway Bill*, 1866, 190, a piece of land at Edgware had been bought and taken possession of by the Edgware, Highgate, and London Railway for the purpose of constructing their station at Edgware. The Referees reported that the line of railway proposed by the promoters passed through this piece of land upon the same level with the authorised line of the Edgware, Highgate, and London Railway, and touching it within said land ; that, in fact, as laid out, it must do so in order to effect a junction with the authorised Watford and Edgware Railway ; that the promoters had expressed an intention of making a joint station at Edgware, but that no powers were taken in any Bill to do so ; and that, "subject to the above observations, the Referees were of opinion that there were no engineering objections to the proposed works." In this case, the estimate was not challenged.

II.

Taking Land intended by another Company for the doubling of their Line.

In the *Brecon and Merthyr Tydfil Junction Railway (Northern Lines) Bill*, 1866, 223, the Mid Wales Railway objected to a portion of the proposed line, which they alleged would interfere with the construction and enlargement of their railway, inasmuch as it would be laid down for its whole length over lands purchased for doubling their line ; that at the Treffelinon and Talgarth stations it would occupy their second line of rail ; and that at the Three Cocks Junction it would cross the access to their station on the level, and interfere with the efficient working of their goods-yard. The promoters replied that the object of their railway was the doubling of the petitioners' single line of railway, over which they had running powers. The Referees reported that the works were "inefficient in an engineering point of view."

In the *Okehampton Railway Bill*, 1865, 92, the Launceston and South Devon Railway complained that this line would interfere with the physical construction and enlargement of the petitioners' railway, inasmuch as it was laid down for a distance of $5\frac{1}{2}$ miles in close proximity to their railway, occupying in some places the actual site thereof, and passing under the bridges constructed by the petitioners for the purposes of their own railway ; and that at the Mary Tavy Station the proposed line would pass between the petitioners' railway and the station now being erected by them ; and it was proved that a portion of the promoters' line was intended to be constructed upon land purchased by the petitioners, and which would be required by them for the doubling of their own line. The promoters replied that they could construct their own as a single line within their limits of deviation without infringing upon the peti-

tioners' railway ; but the Referees reported that this could not be done without infringing upon and rendering impossible the intended second line of the petitioners' railway ; that the promoters could not construct a line between the petitioners' line and the cemetery near Tavistock ; and that they would also most probably have to make use of the bridges constructed by the petitioners for their double line, as, in order to pass under the roads which cross over both lines, it might be necessary to alter the gradients of the approaches to the bridges, to do which no powers were taken in the Bill.

In the *Launceston, Bodmin, and Wadebridge Junction Railway Bill*, 1865, 375, the Cornwall Railway Company complained that the construction of a junction at Truro would prevent the widening of their viaduct so as to allow their line, now a single line, to be doubled. To obviate this objection, it was suggested that a junction could be effected within the limits of deviation, by moving the point of junction 2 chains further to the west of the point shown on the deposited plans, and shifting the proposed line so far to the north as to permit the viaduct to be doubled. This could be physically effected, but it would amount to a lengthening of the proposed line to the extent of 2 chains, and it would also shift the point of junction from the position shown on the deposited plans. The Referees reported that "it is extremely doubtful whether this alteration can be legally executed without the consent of the Cornwall Railway Company ; but they are not competent to determine this matter."

In the *Mold and Denbigh Junction Railway (Extensions) Bill*, 1865, 264, the London and North Western Railway objected that where the proposed line No. 1 crossed the petitioners' Treiddyn Branch, a bridge was proposed of only 15 feet in width, whereas the company had land for a double line ; and that hereafter the line might be doubled and used as a through passenger line, as well as a mineral line, from Mold to Wrexham. The promoters replied that the Treiddyn Branch could only be used as a

passenger line, the gradients of it being 1 in 34; and that, if necessary, as the promoters propose a double line, sufficient width of bridge could hereafter be given. The Referees reported that the width, under the present circumstances, was sufficient. It will be observed, however, in this case, that the petitioners did not allege any immediate or positive intention of doubling their line; and the Referees treated that merely as a contingency which "might" occur.

Of a like nature was the decision in the case of the *London, Worcester, and South Wales Railway Bill*, 1865, 86, where the Great Western objected that the proposed railway would cross their Stratford-upon-Avon Branch by a bridge of only 28 feet span, at a point where they had already a single main line with two sidings, and "might" hereafter require an additional line of rail. The promoters stated that they were willing to make the bridge of 40 feet span, which would be sufficient to carry the line over the *existing* line and sidings. The Referees reported that there were no engineering objections. In the *Bromyard and Hereford Railway Bill*, 1866, 88, it was objected that Railway No. 2 ran parallel, on the north side, to the Worcester and Hereford Railway for 3 miles and 5 furlongs, and that Railway No. 3 also ran parallel to the Shrewsbury and Hereford Railway for 2 miles and 5 chains, at a distance, in many points, of not more than 50 feet from centre to centre of each line. It was shown that the Worcester and Hereford Company, though a single line, had taken land and constructed works which defined the second line to be on its south side, and that the Shrewsbury and Hereford Railway had already completed their double line. The Referees reported that "the objections alleged to engineering details are not such as should prevail against the promoters' scheme." In the *Shrewsbury and Potteries Junction Railway Bill*, 1865, 257, the opponents urged that lines Nos. 2 & 3 would extend for a considerable distance closely parallel to the Shrewsbury and Crewe and Shrewsbury and Welshpool Railways, and prevent any future widening of those lines on the side thus approached; and

that No. 1 would cause similar inconvenience by running parallel to the Wellington and Drayton Line, and that it would be interposed between that line and Hodnet. The Referees reported that the proposed lines would not unduly interfere with the petitioners' railways, and that they are calculated to relieve the Shrewsbury Station of much traffic that now enters it only for the purpose of being shunted and marshalled for conveyance in different directions; and further, that the objections alleged to engineering details were not such as should prevail against the promoters' scheme.

III.

Taking Land intended for another Company's Sidings.

In the *Ely and Ogmore Valleys Junction Railway Bill*, 1865, 423, the Ely Valley Extension Railway urged, among other objections, that line No. 1 should have joined their line, instead of passing under it in a deep cutting, interfering with the only ground for sidings at that point. The Referees reported that the works of this line, as laid out, were not efficient for the object proposed, inasmuch as the proposed railway did not join the Ely Valley Extension Railway, and "interfered in a most prejudicial manner" with their siding ground. In the *Swansea and Aberystwith Junction Railway*, 1865, 419, the proposed railway would run for about 3 miles beside the Towy Vale Railway. The Referees reported that the lines for all the distance would be so close together that they were described as being on separate embankments, with only a ditch between them, and that, as sidings for local accommodation could only be placed on one side of each, they would be two one-sided railways; and that, as they also passed along the agricultural district of the Vale of Towy, generally nearly on the level and intersecting the farms, any accommodation

or other roads must be carried across both lines, which would be inconvenient and dangerous. And in the *West Bromwich and Walsall Railway Bill*, 1866, 217, the London and North Western Railway objected that by the bridge by which it was proposed to carry the line over the Grand Junction Railway at their Bescot Station, the petitioners would be prevented from extending their siding accommodation at that station. The Referees reported that the span of the bridge should be enlarged so as to cross the whole of the property of the Grand Junction Railway at the point of crossing, and that an additional opening of 24 feet span should be made in the embankment at each end of such enlarged span of the bridge.

IV.

What if the Opponents have long neglected to make use of the land alleged to be required by them for Station, Doubling Line, Sidings, &c.

If it should appear that the petitioning company have no use for the land proposed to be taken, or that they have so long delayed to turn it to the use for which it was obtained as to lead to that inference, the Referees will not consider it an engineering objection if it is proposed to be taken by another company. Thus, in the *Mold and Denbigh Railway (Branches, &c.) Bill*, 1866, 220, the London and North Western objected that the proposed diversion of the stream near their Llong station, along the south side of their line, and the construction of the proposed railways close to their fence, for 2 miles on the north side, would so confine the space as to prevent them from laying down any sidings at the Llong Station, and from hereafter making any communications from the north side. The promoters replied that the petitioners' railway had been in use for 15

years ; but that, though they had taken land for a double line, they had only laid down a single line, and had not constructed any communication on the north side. The Referees reported that there were no engineering objections, and that the works were efficient.

V.

Taking Land which another Company are authorised to take, but have not yet taken.

In the case of the *Maidstone and Ashford Railway Bill*, 1866, 65, this objection was taken, but was not sustained by the Referees on its being admitted by the petitioners that the land might be made to serve the purposes of both companies. The facts were these :—The London, Chatham, and Dover Railway objected that Railway No. 2 was laid down through certain lands adjoining the town of Maidstone, which they had authority to purchase land, and upon which they intended to place a station, with approaches from Weeks Street and Water Lane, which would be intercepted by the proposed line. No lands had actually been purchased, nor any works commenced, and it was admitted that a station might be erected which would serve the purposes of both companies. The Referees reported that there were no engineering objections.

VI.

What if the compulsory Powers enabling the Opponents to take the Land have expired.

Where the compulsory powers of the petitioners for taking the land had expired, and the period for completion

of works would expire in three months, the Referees refused to sustain the petitioners' objection. This was in the *London, Brighton, and South Coast Railway (St. Leonard's and Hastings Lines) Bill*, 1866, 254, where the South Eastern objected that the proposed Railway would prevent them from obtaining access, by the tramroad authorised by "The Hastings Harbour Act, 1853," to the pier and harbour at Hastings. The Referees reported that the tramroad had not yet been commenced, but that the relative levels of the two undertakings would be such that the tramroad could, without difficulty, be carried over the proposed railway; and further, that the compulsory powers under the Act to purchase lands had already expired, and that the period for the completion of the works would expire in three months, and that the works were efficient.

SECT. II.

INTERFERENCE WITH ANOTHER COMPANY'S EXISTING WORKS.

I.

Extent to which interference with another Company's existing sidings will be allowed.

In the *Evesham and Redditch Railway Bill*, 1865, 85, the Great Western objected that the line, No. 3, as laid down on the deposited plans, would cross the sidings leading to their goods station, turntable, and engine sheds, upon an embankment of the height of 4 or 5 feet, placed upon the rails of the said sidings. The Referees reported that "crossing them in this manner would be most objectionable, as it would entirely block up these sidings." The promoters, however, offered, by commencing their gradient towards the station (which on the deposited plans was 1 in 100),

some chains further off, to cross the sidings on the level of the rails ; and the Referees reported that if the sidings were crossed on the level, there would be no engineering objection to the proposed line.

In the *Ogmore Valley Railway* (No. 1) Bill, 1865, 420, it was objected that the sidings of the Llantrissart and Taff Vale Railway would be rendered useless for junction purposes, from the proposed line, No. 5, bisecting them on the level, and that the point of junction was where the passenger traffic of the two lines, the Ely Valley and the Llantrissart and Taff Vale, would pass, according to the requirements of the Board of Trade, and that the Llantrissart line had no power to alter the position of their sidings. The promoters replied that these sidings were not legally authorised, and ought not to be there, and that they could by arrangement be shifted so as to avoid any difficulty. The Referees reported that, in regard to the legality of the said sidings, they expressed no opinion, but they considered the manner in which the line, No. 5, proposed to meet them as objectionable in an engineering point of view, and that the line, No. 5, was defective in an engineering point of view, if the sidings were legally in their present position. In the *West Bromwich and Walsall Railway Bill*, 1866, 217, the London and North Western Railway objected, and it was admitted, that railway, No. 2, would cut through six sets of sidings at Bescot Station, in order to effect a junction with the Grand Junction Railway ; and the Referees considered that the line was defective in an engineering point of view, as laid out. The promoters, however, further alleged that the line could be so altered, within the limits of deviation, as to affect the proposed junction with the Grand Junction Railway without interfering with the said sidings. The Referees : " it is doubtful whether this can be effected, and, in the opinion of the Referees, the effecting of the said junction ought to be made, dependent upon the consent of the London and North Western Railway." In the *North British Railway (Carlisle Citadel Station Branch) Bill*, 1865, 297, Rail-

way, No. 2, would cross a siding to the west of the existing goods line, and destroy the use of it; but the Referees reported that this siding was used chiefly for the reception of North British trains, which, if the proposed line be made, would be accommodated elsewhere. In the *London and North Western Railway (New Works, &c.) [England and Scotland] Bill*, 1865, 242, a line promoted by the London and North Western, to join the St. Helen's Railway, was objected to by owners, &c., along the line, because it would, on a gradient of 1 in 80, pass through and cross all the lines of sidings of that Company's good station (13 pair of rails), and their goods yard. The promoters replied that they had purchased land lately in the immediate vicinity of the St. Helen's Station, for station purposes, and proposed to move all the sidings and goods yards mentioned by the petitioners to another part of the St. Helen's Railway, so as to avoid any crossing or interference with the sidings and stations. The Referees reported that the line might safely be constructed in the way proposed, and that there were no engineering objections.

II.

Destroying points constructed for turning trains from swinging bridge when opened.

In the *Swansea Vale and Neath and Brecon Junction Railway Bill*, 1865, 372, the Vale of Neath Railway objected to a proposed junction with the Swansea and Neath Railway, close to the swinging bridge which carries the latter line over the new cut leading to the harbour and north docks. The control of this bridge is vested in the Swansea Harbour Trustees, and the bridge is opened at irregular intervals during a period of four hours for each tide. In order to prevent danger to trains running from the Swansea and Neath line over the bridge, the Board of

Trade required that points should be put into that railway, in such a manner that a train coming towards the bridge, should be deflected into the curve forming a junction with the promoters' railway, instead of passing forward to the bridge, unless the points were expressly laid for the passage of a train over said bridge. The Referees reported that if the junction proposed be constructed, the benefit of this arrangement would be taken away, and the danger of accident in passing said bridge would be augmented ; but that with care and constant attention the junction could be worked.

III.

Crossing another Company's line on the level.

In the *Pembroke and Tenby Railway Bill*, 1866, 256, the Great Western objected to two level crossings, as being in close proximity to level crossings in their railway at the several points. The promoters stated in reply, that the two railways would be in such close proximity to each other, that the two proposed level crossings and those now existing in the petitioners' railway at these points, could be worked by one gatekeeper, without increase of danger to the public. The Referees reported that, in an engineering point of view, the works proposed were efficient. (a) In the *Peterborough, Wisbeach, and Sutton Railway Bill*, 1865, 119, the Great Eastern Railway objected that, if a proposed junction with their line at Wisbeach were sanctioned, it would cause their line to be crossed on the level in front of their station. The Referees reported that there was no engineering objection to this junction being made, "under proper arrangements between the Companies." In the *Hallow Railway Bill*, 1865, 61, the South Eastern alleged that a proposed junction at the Tonbridge Station

(a) A level crossing over a turnpike road was allowed, for a like reason, in the *Bo'ness &c. Bill*, 1866, 264.

would cause serious inconvenience in the working of their traffic, as one of the branches of the proposed line would cross the petitioners' main line in approaching the station ; and they maintained that the proposed line should, therefore, be carried either over or under their railway. The Referees considered that "either of these alterations of the deposited plans would be objectionable and unnecessary." The proposed junction would be formed about a quarter of a mile from the station, and the petitioners' line would be crossed 700 feet from the south end of the goods station, and 2,300 feet from the end of the passenger station, and the petitioners' railway at that point is upon a long straight line, nearly level. The Referees reported that the junction as proposed was quite practicable, and would be safe "under proper management."

In the *Crofthead and Kilmarnock Extension Railway Bill*, 1865, 77, the Glasgow and South Western objected to a junction with their main line, very close to the station of Kilmarnock, on the ground that it would be necessary to cross upon a level certain lines of theirs leading to certain coal pits now being worked, and that the effecting of such junction with the main line would interfere with their access to certain sidings on the west of their line. The Referees reported that the making of "the proposed junction would not be objectionable, if made under proper arrangements, such as a blind siding to the coal pit line.

Crossing an abandoned line on the level.

In the *Wrexham, Mold, and Connah's Quay Railway Bill*, 1865, 260, it was proposed to cross on the level an abandoned branch of the existing Wheatsheaf line. The petitioners admitted that this line was not at present worked, but said it might be brought into use again. The Referees reported, in reference to this and certain other proposed level crossings, that "the inconvenience that would arise from the level crossings complained of, was not proved to them to be of such a nature as to constitute an engineering objection."

Where speed of trains slow at point of crossing.

In the *Connah's Quay Railway and Docks Bill*, 1865, 258, it was objected that Railway No. 1 would cross the

Buckley line of railway leading to the present basin at Connah's Quay upon the level, the said railway being there upon a gradient of 1 in 34; but it was proved that the point of crossing is near the termination of the said Buckley Railway, where the speed of trains must be slow; and, further, that the Railway No. 1, when completed, would supersede that part of the Buckley Railway, save for a small portion of local traffic. The Referees reported that there was no engineering objection to such crossing. And in the *London and North Western and Midland Counties Coal Fields Railway Bill*, 1866, 198, it was objected that Railway No. 5, in order to make a junction at Burton with the London and North Western Railway, would cross the branch of the Midland Railway, which leads to the breweries on the level, at a point close to where the London and North Western and North Staffordshire Railways join that railway. It was proved that the lines to be so crossed were only used for slow goods traffic. The Referees reported that the junction would be unobjectionable. In the *Vale of Neath Railway (Swansea Lines) Bill*, 1865, 367, it was proposed to cross on the level a low level railway of the Swansea Harbour Trustees, upon which there was a considerable mineral traffic, and which was worked by horses. The Referees reported that the proposed railway was merely a siding into a proposed new goods station; that trains never could be run over it at any speed; and that, as the control of the crossing and signals would be in the hands of the petitioners, they were of opinion that there were no engineering objections to the construction of the proposed line. And in the *North British Railway (Camps, &c., Branches) Bill*, 1866, 375, the Caledonian Railway objected that railway No. 2 would be carried across an authorised line of theirs. The Referees reported that both lines were purely mineral lines, and could not have any great traffic; and that, therefore, there would not be any serious engineering objection.

See also as to crossing local lines on the level in order to

Line to be crossed
mineral.

Both lines
mineral.

Crossing local
lines on level
to join main
lines.

effect junctions with main lines, *East London Railway Bill*, 1865, 113, and *London, Brighton, and South Coast (Additional Powers) Bill*, 1865, 143, cited Chapter V.

IV.

Interference with the station arrangements and approaches of another Company.

In the *London, Chatham, and Dover Railway (No. 2) Bill*, 1865, 59, the South Eastern Railway alleged that the proposed line, as laid down, would cut off the access to Beckenham Station, and by approaching closely to the booking office would necessitate its removal, and injuriously affect the arrangement of the platform and lines for the accommodation and interchanges of local traffic between the two companies; and they suggested that the line might be deviated within the parliamentary limits, and lowered five feet, so as to be carried under the present approach road, and not to interfere with the existing station arrangements. The promoters stated that their object was to carry the fast through traffic past the Beckenham station without interfering with the local traffic; and they proposed to carry out the works by widening an adjoining bridge, which carries a public road over the railway to a sufficient width to give a convenient approach, and by erecting a new booking office on the level of the bridge, with separate stairs descending to the different platforms, and by transferring only some unimportant sidings and a turn-table from one side to the other, without in any material point altering the arrangements of the existing lines. The Referees reported that there were no engineering difficulties, and that the proposed works were efficient. In the *Surrey and Sussex Junction Railway Bill*, 1865, 75, the London, Brighton, and South Coast Railway objected that Railway No. 2, if constructed where the centre line is

laid down on the plans, would cross the approach to their new station at Croydon within ten yards of the same, and, being there upon an embankment of five feet, it would block up the approach to the said station. This was admitted by the promoters; but they proposed to deviate their line from the centre line, within the limits of deviation, so as to remove it to a sufficient distance from the new station, and to afford an approach to the same by means of Crohan Lane, which the proposed line would cross by a flat girder over-bridge. The Referees reported that, if these proposals were carried out, they would remedy the objections as regards the new station. In the *Crystal Palace New Railway Bill*, 1865, 159, the London, Brighton, and South Coast Railway objected that Railway No. 2 would prevent the making of an intended approach to the petitioners' Croydon Central Station, and that the carrying of the said line under the main lines of the petitioners would be attended with danger. At the site of the intended approach Railway No. 2 would be 19 feet below the surface of the ground. The Referees reported that the intended approach could readily be constructed over it, and that, "with the ordinary precautions," the carrying of the Railway No. 2 over the petitioners' main line would not be attended with danger. In the *Mold and Denbigh Junction Railway (Extensions) Bill*, 1865, 264, the London and North Western Railway complained that their station at Mold would be seriously prejudiced by the proposed deviation of a turnpike road, from which their station is now approached on either side, and that the descent on the Mold side from the turnpike road would be altered from 1 in 18 to 1 in 11 or 1 in 15. The promoters replied that the slope would continue 1 in 18, and end before reaching the door of the station building; that there would be sufficient level for the use of carriages, and that the access from the goods station would be improved. The Referees reported "that in regard to the interference with the London and North Western at Mold, the proposed arrangement would cause some inconvenience to the public." In

the *North British Railway (Carlisle Citadel Station Branch) Bill*, 1865, 297, Railway No. 3 was objected to on the ground that, by joining the goods lines, it would shorten the space available for the standing of a train from 1,100 feet (its present length) to 950 feet, which would be insufficient; and, also, that it would require additional points and signals to be introduced and worked. It was proved that upon certain occasions the entire space (1,100 feet) was insufficient for the accommodation of the trains coming into the goods lines. It was proposed to work some of the points and signals, to be introduced, by another man in addition to the person at present in charge of the points and signals at the north end of the station; but the Referees reported that, to ensure safety, all the points and signals at that end should be under the control of one man; and that, if the proposed railways should be executed, the number which must then be placed in his charge would be excessive; that there were then six companies making use of the Citadel Station, and the traffic was very crowded, 476 engines passing the signal-box at the north end within the 24 hours; and that, if the proposed lines were made, some of those engines belonging to the North British Railway would not pass that signal-box; but that the passenger train engines would still pass along or across the existing lines.

V.

Interference with the Arch of another Company.

In the *Burton-upon-Trent and Nottingham Railway Bill*, 1865, 217, the Midland Railway objected that it was intended to appropriate one of the arches of the bridge carrying Hawkins Lane in Burton-upon-Trent, over the Midland and North Western Railways, this bridge having been built by the Midland, and the arch reserved for their

own use. The promoters contended that, if they should not be permitted to do so, they could effect their purpose by constructing another arch under Hawkins Lane, which they could do without altering the level of the lane. The Referees reported that "it would be preferable, in an engineering point of view, that the arch reserved by the Midland Railway Company should not be interfered with."

VI.

When the Promoters' powers of Deviation will be restricted.

In the *North British Railway (Glasgow Branches) Bill*, 1866, 221, the City of Glasgow Union Railway objected that the Railway No. 7 would, for a distance of half a mile, be parallel to, and pass so near the petitioners' authorised railway (parts of the latter being included within the limits of deviation) as to interfere with the efficient construction of their line. The promoters replied that, though the limits of deviation of No. 7, had been carried beyond those of the petitioners' railway, they had no intention of interfering with their works, which as yet had not been constructed. The Referees reported that there would be no difficulty in constructing both the authorised and the proposed railways, without interference with each other; but they thought that the promoters should be so restricted as to prevent them from deviating for more than the width necessary for the construction of one-half their railway from their centre line, as shown in the deposited plan, in the direction of the Glasgow Union Railway, without the consent of the petitioners. In the *Caledonian Railway (Greenock and Gourock Extensions) Bill*, 1866, 109, the Greenock Harbour Trustees objected that the foot of the slope of an embankment upon which Railway No. 1 was to be constructed, would project beyond

the line of the seawall of the Albert Harbour. But the promoters undertook that it should be so removed backward that the foot of said slope should not project in any manner. In the *Same Bill* the promoters further undertook not to take any land comprised within the limits of deviation of the authorised line of the Greenock and Ayrshire Railway.

SECT. III.

MISCELLANEOUS INSTANCES OF INTERFERENCE WITH OTHER LINES.

I.

Objection that Promoters' trains will have to stand on Petitioners' Main Line.

In the *Perth General Railway Station Bill*, 1865, 180, the Joint Committee for the management of the General Station at Perth objected that inasmuch as the junction of No. 2 with No. 1 was to be made close to the Glasgow Road Bridge, where the line of the Scottish Central terminates, it might be necessary for the interchange of traffic that trains coming from the north should stand upon the Scottish North Eastern Main Line before entering No. 2, and so block the main line. The Referees reported that this would be an engineering defect, unless the Scottish North Eastern Railway were empowered to use No. 2 for the purpose of delivering traffic coming from the north consigned to the Scottish Central Railway. And in the *North British Railway (Carlisle Citadel Station Branch) Bill*, 1865, 297, it was objected that Railway No. 2 would cross the goods line and also the main passenger lines, for the purpose of forming junctions with the latter, and also with the line appropriated to the North British at the west side of the North Dock ; and it was objected that trains

running over the said railway into the portion of the North Dock appropriated to the North British, would stand across and block up the main lines of the said station. The Referees reported that "the crossing of the said lines will cause a serious obstruction to the traffic thereof, and if any train of above 12 carriages should run into the North Dock, it will block the main passenger lines."

II.

Destroying points at Junctions.

In the *North British Railway (Carlisle Citadel Station Branch) Bill*, 1865, 297, the Referees reported that "No. 2 Railway will also destroy two sets of points within the station now used for effecting junctions between the lines therein, and no substitutes have been pointed out for such junctions. It will require four additional sets of points to be introduced within such station, which will be required to be worked from the present signal station 100 yards distant."

III.

Doing that which will entail expense on another Company without countervailing advantage.

In the *Havant, Hambleton, and Droxford Railway Bill*, 1865, 45, where the promoters proposed to divert a certain turnpike road, the petitioners, who were about to construct a bridge over the same road, objected that the proposed diversion would necessitate the construction of a skew bridge in the place of a square one, as proposed by them, which would cause a consequent increase of expense to them for the sole benefit of the promoters. The promoters agreed to divert the turnpike road without any interference with the petitioners' bridge.

IV.

Passing under Petitioners' Line in such a way as to prevent their lowering same.

In the *Bromyard and Hereford Railway Bill*, 1866, 88, it was objected that a height of only 16 feet 6 inches from rail to rail was provided for the line to pass under the Shrewsbury and Hereford Railway ; and it was contended that this would prevent the lowering of that line in future, should occasion so require. The Referees reported that this height would give sufficient headway ; that no evidence was given to show that the Shrewsbury and Hereford line would require any alteration of its level ; and that this objection was not valid.

V.

Doing that which will prevent another Company from using a line over which they have running powers.

In the *Fulham Railway Bill*, 1865, 127, the proposed Railway No. 2 would terminate by a junction with the Hammersmith and City Railway. By an Act passed in 1864, the South Western were authorised to effect a junction with the Hammersmith and City Railway near the station now existing, to run over certain portions of the same, and to become joint owners of an exchange station to be constructed in the vicinity of the existing station at Hammersmith. The South Western Railway complained that Railway No. 2, if the junction proposed should be effected as laid down on the plan, would debar them from using the portion of the Hammersmith and City Line which they were entitled to use, and from the use of the

joint station. The promoters, to obviate these objections, proposed to effect their junction at a point 6 chains south of the point originally proposed, and with this the South Western Railway were satisfied.

VI.

Cutting off Communication between Petitioners' Line and a Quay, the traffic of which it accommodates.

In the *Lynn and Sutton Bridge Railway Bill*, 1865, 74, the Great Eastern objected that while the Harbour Branch of their railway runs along a quay beside the river Ouse, and accommodates the traffic shipped or unshipped thereon, the proposed railway is to pass on the same quay between this branch and the river, and on the same level, so as to cut off their communication with the river, and otherwise interfere with their land and property, as well as with several sidings leading to certain coal drops on the river, these crossings being on a level. The Referees reported that "the proposed line will interfere, to a certain extent, with the communication of the Harbour Branch of the Great Eastern with the river, and with the access to the coal drops; but otherwise there are no engineering objections to it."

VII.

Imperilling another Company's Line through danger arising from slips, &c.

In the *Mold and Denbigh Junction Railway (Extension) Bill*, 1865, 264, the Wrexham and Minera and Great Western Companies alleged that Railway No. 1 sought to effect an ill-advised and defective junction with their line

at Wrexham, and was badly laid out in an engineering point of view. In support of this allegation, the petitioners stated that they had experienced considerable difficulties in constructing their own line owing to the soft and shifting nature of the soil ; and that, although it was nowhere in deep cutting, constant slips had taken place ; that the proposed line was, where it crossed under petitioners' line (at the point on embankment) 52 feet below the surface ; that further on, the promoters proposed a cutting of 18 feet, which would imperil the foundations of petitioners' railway. The promoters called evidence to show that although the construction of the line might be expensive from the nature of the soil, it was practicable ; and that the depth of the cutting alleged by the petitioners was exceptional, and owing to the formation of the land at that point. The Referees reported that "sufficient care had not been taken to ascertain accurately the nature of the soil on which the works are proposed to be constructed."

SECT. IV.

WHAT IF THE INTERFERENCE COMPLAINED OF RESULTS FROM PETITIONERS' HAVING ALTERED CONDITION OF THEIR LINE, &c., SUBSEQUENTLY TO DEPOSIT OF PLANS.

If the petitioners have added an additional line to their railway, or constructed sidings subsequently to the promoters' survey and the deposit of the plans, the Referees will deal with such additional line or sidings as if they had existed prior to the deposit of the plans ; and, therefore, will not hold their non-existence at that date, as any excuse for undue interference therewith by the proposed line. Two cases of this nature have occurred. In the *North Surrey Railway Bill*, 1865, 110, the London, Chatham, and Dover Railway alleged that, at a proposed point of junction at Clapham Station, their railway

consisted of four lines of way, two of which were intended to be appropriated to the City traffic of their own line, and the other two to the London, Brighton, and South Coast Railway; and that, as the junction was only proposed to be effected with the latter two lines, no proper junction could be made with the petitioners' lines ; and that the powers contained in the Bill for the promoters to enter into working arrangements with the petitioners could not be carried into effect. The promoters replied that at the time when the survey and plans were made, there were but two lines of rails on the London, Chatham, and Dover Railway at the Clapham Station, and with these two the proposed junction would be effected. The Referees reported that "If this railway is intended to facilitate the access to the City, the engineering will be defective unless the junction be also effected with the London, Chatham, and Dover lines ; and to do this it would be necessary to cross the two lines appropriated to the London, Brighton, and South Coast Line." And in the *North British Railway (Carlisle Citadel Station Branch) Bill*, 1865, 297, the Caledonian and other Companies objected that Line No. 2, would intersect a part of the petitioners' new goods-yard, and cross some of their sidings so as to render them less serviceable. The Referees reported that a clear headway of 11 feet 6 inches would be left over the sidings in question, which headway, if deemed necessary, might be increased by about 6 inches ; that there would not be any injurious interference with the said sidings or goods-yard ; and that, it was to be observed, that, at the time of making the plans deposited, no sidings were in existence in said goods-yard, but that they were, nevertheless, *bond fide* sidings, the new goods station being in course of erection.

SECT. V.

INTERFERENCE WITH A RAILWAY AUTHORISED BUT NOT
YET CONSTRUCTED, OR WITH A PROPOSED LINE NOT
YET AUTHORISED.

If, for example, a proposed junction appear from the deposited plans to be impracticable, in consequence of the level of the proposed line, as shown, being incompatible with the level of the opposing line, as authorised or as proposed, and if by mutual alteration of gradients the two lines may be brought to the same level, the Referees will not report that there exist any engineering obstacles. Such was the course adopted by the Court in the following cases:—In the *Bromyard and Hereford Railway Bill*, 1866, 66, the Great Western alleged that the gradient of the Western fork of the double junction of Railway No. 1, and that of the Worcester, Bromyard, and Leominster Railway, with which the junction was intended to be effected, were incompatible. The last-mentioned line had not yet been constructed; and the Referees reported that, although the junction could not be effected as shown on the deposited plans, it was practicable by an adjustment of the gradients of the two lines, within their powers, when under construction. And in the *Croydon, Mitcham, and Kingston Railway Bill*, 1866, 92, it was objected that where Railway No. 4, formed a junction with the Kingston, Malden, and Wimbledon Junction Railway, the gradients and curves of those two lines, as shown on the deposited plans and sections, were incompatible. The Referees reported that as neither of these lines had yet been constructed, and it was not denied that by an alteration of both, which could be made within the powers of the General Act, the junction might be effected, this objection was not valid.

Gradients
incompatible.

Gradients
and curves
incompatible.

The same principle is followed where it is proposed that the promoters' line should cross on the level another line not yet constructed or authorised, and there appear from the respective plans and sections a difference in the levels of the two lines at the point of crossing. Thus, in the *Wood Green, Winchmore Hill, and Enfield Railway Bill*, 1865, 108, the Great Eastern complained that the railway would cross a projected line of theirs to Winchmore Hill within one foot of the level of the same. The Referees reported that though the construction of both lines at the proposed levels was incompatible, yet "as neither had received the sanction of Parliament, this objection, in an engineering point of view, was not admissible." Again, in the *Croydon, Mitcham, and Kingston Railway Bill*, 1866, 92, it was objected that where the line crossed the proposed line of the City, Kingston, and Richmond Railway, it was 3 feet 9 inches under the level of that line, as shown by the respective sections. The Referees reported that as neither of these lines had yet received the sanction of Parliament, that did not constitute an engineering objection to the proposed line. And in the *Caledonian Railway (Greenock and Gourock Extensions) Bill*, 1866, 109, the Greenock and Ayrshire Railway Company complained that the promoters No. 1 line, terminating in the Clyde, was laid out so as to cross a line of railway proposed to be made by the petitioners (and for which a Bill was now before Parliament), in a similar direction to No. 1, so as to extend railway accommodation to the traffic of steamers. The Referees reported that this crossing and all interference could be avoided by altering the direction of both railways, so that they may run in a parallel direction, that of the petitioners being kept to the seaward of No. 1, and that such alterations were within the limits of deviation.

Levels incompatible at point of crossing on level.

And, generally, it may be taken as the rule, that if by mutual alteration of the two schemes within their powers of deviation, the engineering difficulty complained of can be obviated, the Referees will report in favour of the pro-

posed line. The following cases further illustrate the practice of the Referees in this matter. In the *Burton-upon-Trent and Nottingham Railway Bill*, 1865, 217, it was objected that Railway No. 1 would be carried so close to the authorised North Staffordshire Railway as to interfere with the slopes thereof. The referees reported that this could be obviated by constructing the embankment of the latter railway with a retaining wall where it may be necessary, and that there was ample room for both lines. In the *Barnet, Hendon, and Midland Junction Railway Bill*, 1866, 205, the Edgware, Highgate, and London Railway objected that the junction of the proposed railway with their railway was objectionable, inasmuch as it was made south of, and at a greater distance than necessary from, the Finchley Station. The promoters stated in reply that the junction could be effected within the limits of deviation nearer to the station; and that, by a small alteration of its site, the station (not yet built) might be made convenient for the use of both railways. The Referees reported that the works were efficient.

In the *Bo'ness, Grangemouth, and South Alloa Junction Railway Bill*, 1866, 264, it was objected that the level of the rails, as shown on the sections, where the line crossed over the North British Bridge of the Forth Railway, would not afford a sufficient headway for that line. It was answered that the bridge of the Forth Railway was not yet constructed, and there would be no difficulty in giving ample headway for that line, by having recourse to the lateral and vertical deviations permitted by the General Act. The Referees reported that the works proposed were efficient.

The *London, Chatham, and Dover and South Eastern (Kennington, Clapham, and Brixton) Railways Bill*, 1866, 163, and the *Brixton, Clapham, and Balham Extension Railway Bill*, 1866, 165, proposed to construct railways which, between Brixton and Streatham, would be nearly parallel to each other, and, according to the deposited plans and sections, the lines would intersect at Brixton, the

Interference
with slopes of
authorised
embankment.

Proposed
change of site
of petitioner's
authorised
station.

Insufficient
headway over
authorised
line.

former passing over the latter at a height of from 7 feet to 9 feet 6 inches only. In their report on each of the Bills the Referees merely stated the above facts, without comment.

SECT VI.

HEADWAY AND SPAN OF BRIDGES OVER OTHER LINES—DISTURBING GRADIENTS OF OTHER LINES BY SUCH BRIDGES.

In crossing over another line, it is obviously necessary Headway. that the promoters should provide sufficient headway, so as to allow that line to be efficiently worked. In order to obtain such headway, to what extent will the promoters be allowed to disturb the gradients of the line over which they pass? It is provided by the General Railways Act, s. 49, (a) that :—

“The descent made in the road, in order to carry the same under the bridge, shall not be more than one foot in thirty, if the bridge be over a turnpike road; one foot in twenty, if over a public carriage road; and one foot in sixteen feet, if over a private carriage road, not being a tramroad or railroad; or if the same be over a tramroad or railroad, the descent shall not be greater than the prescribed rate of inclination; and if no rate be prescribed, the same shall not be greater than as it existed at the passing of the Special Act.”

In consequence of this provision, unless the promoters obtain special powers, the gradient of another line, over which their line passes, cannot be interfered with; and the promoters must therefore so direct the gradients of their proposed railway as to pass over such lines at a sufficient elevation. Objections on the score of insufficiency of head-

(a) Similar provision for Scotland in Railway Clauses (Scotland) Act, sect. 42.

way are, however, almost invariably obviated, before the Referees, by some alteration within the promoters' powers of vertical and lateral deviation. The following are miscellaneous instances of this class of objections to engineering :—

In the *Burton-upon-Trent and Nottingham Railway Bill*, 1865, 217, it was objected that Railway No. 1 would be carried over the Midland Railway by a bridge which was shown in the deposited plan to have only a height of 16 feet from rail to rail, and that this would not afford sufficient headway ; but the Referees reported that, by a trifling alteration, sufficient headway could be obtained.

In the *Aberdare Valley and Caerphilly Junction Railway Bill*, 1866, 115, the Taff Vale Railway alleged that the proposed line would cross diagonally over their Llancaigh Branch, which at that point was on a gradient of 1 in 8, so as to leave a minimum headway of only 8 feet ; that, although their branch could not be worked by locomotive power, certain of their engines, with reduced funnels, were passed along it for use elsewhere ; and they contended that sufficient headway ought to be given to allow a locomotive with a funnel of the ordinary height to pass. The promoters proved that the branch was crossed near the same place by a turnpike road bridge with a minimum headway of 10 feet 3 inches ; and also that by crossing a few yards farther down the incline, within the limits of deviation, they could give a minimum headway of 14 feet. The Referees reported that the headway as proposed was equal to that now given under the road bridge ; but that, with a view to future contingencies, it was desirable that the proposed line should be so constructed as to give a headway of 14 feet.

In the *Caledonian Railway (Greenock and Gourock Extensions) Bill*, 1866, 109, the Referees reported that Railway No. 3 would cross a proposed line of the Greenock and Ayrshire Railway with a difference of level of only 10 feet 8 inches ; but that, as the last-mentioned line was there descending on a gradient of 1 in 70, by shifting the point of crossing 300 feet to the eastward (which could be

done within the limits of deviation) Line No. 3 could cross with a clear headway of 13 feet 6 inches.

Where the promoters' line proposes to cross, with an insufficient headway, the line of another company not yet constructed, but either already authorised or before Parliament, and by mutual alteration of gradients within the powers of deviation, the necessary headway can be provided, the Referees will not report unfavourably of the proposed line. See *Bo'ness, Grangemouth, and South Alloa Junction Railway Bill; London, Chatham, and Dover and South Eastern (Kennington, Clapham, and Brixton) Railway Bill; and Brixton, Clapham, and Balham Extension Railway Bill*, cited in sect. 5 of this chapter.

It will also be a valid engineering objection if the pro- SPAN. moters propose to cross over another line by a bridge the span of which is insufficient to clear the line and sidings of the latter. Thus in the *Evesham and Redditch Railway Bill*, 1865, 85, the Great Western objected that Line No. 1 would cross the main line and sidings of their Stratford and Honeybourne Branch, which there consists of a main single line and two sidings, by an arch of only 26 feet span. It was admitted that such a span would be insufficient to cross over the line and sidings. The Referees reported that if the span were increased to 40 feet there would be no engineering objection.

And it is to be kept in view that it is not only necessary that the promoters' bridge should clear the lines of rails and sidings actually laid down and used by the line to be crossed, but if there be an intention on the part of the petitioners to lay down additional rails, or construct sidings at that spot, the bridge must be of sufficient span to meet these future contingencies. See the *West Bromwich and Walsall Railway Bill*, 1866, 217, where the promoters were required so to enlarge the span of their proposed bridge, and make other provisions as to admit of the future extension of the sidings of the Grand Junction Railway, over whose line they were to pass. And in the *London, Worcester, and South Wales Bill*,

1865, 86, the Great Western objected that the proposed railway would cross their line by a bridge of only 28 feet span at a point where they had at present a single main line with two sidings, and might hereafter require space for an additional line of rail. The promoters stated that they were willing to make the bridge of 40 feet span, which would be sufficient to carry the line over the existing line and sidings. The Referees reported that there were no engineering objections. In this case, however, it will be noticed that the petitioners did not allege a positive intention to construct the additional line of rail, but merely that they "might hereafter require" to do so. See an analogous case, the *Mold and Denbigh Junction Railway (Extensions) Bill*, 1865, 264.

SECT. VII.

HEADWAY OF BRIDGES UNDER OTHER LINES—DISTURBING GRADIENTS OF OTHER LINES BY SUCH BRIDGES.

It is provided by the General Railways Act, 1845, sect. 50, (a) in reference to bridges under roads and other lines, that :—

"The ascent shall not be more than one foot in thirty feet, if the road be a turnpike road; one foot in twenty feet, if a public carriage road; and one foot in sixteen feet, if a private carriage road, not being a tramroad or railroad; or if the same be a tramroad or railroad, the ascent shall not be greater than the prescribed rate of inclination; and if no rate be prescribed, the same shall not be greater than as it existed at the passing of the Special Act."

The promoters cannot therefore do anything which will necessitate the alteration of the gradient of a line under

(a) Similar provisions for Scotland in Railway Clauses (Scotland) Act, sect. 43.

which they pass, without special powers. Objections raised by such lines, on the ground of insufficiency of headway, are not uncommon, but are usually remedied by the promoters undertaking, within the limits of deviation, to make their gradient a little steeper, or to begin the incline at a farther distance, so as to obtain the necessary headway. Thus in the *Barnet, Hendon, Hampstead, and London Railway Bill*, 1865, 69, the Metropolitan and St. John's Wood Railway objected that Line No. 1 would cross under the petitioners' Hampstead Extension, with only 11 feet headway, and that Line No. 2 would pass under the same line with only 10 feet headway, a height insufficient for locomotives and carriages ; and that to obtain the requisite height of 14 feet, must interfere with the gradient of the Hampstead Extension Line, which was a gradient of 1 in 27. The promoters, to obviate this objection, agreed to alter their gradient under that line.

In the *Burton-upon-Trent and Nottingham Railway Bill*, 1865, 218, it was objected that Railway No. 3 could not be constructed, as proposed, to pass under the North Staffordshire Railway, as the headway would be insufficient ; but, No. 3 being there upon a gradient of 1 in 1,016, and having 660 feet further to run before reaching its point of junction with the London and North Western Railway, the Referees reported that by making the gradient a little more steep, still being less than 1 in 500, ample headway could be provided.

In the *Bromyard and Hereford Railway Bill*, 1866, 88, it was objected that a height of only 16 feet 6 inches from rail to rail was provided for the line to pass under the Shrewsbury and Hereford Railway, and it was contended that this would prevent the lowering of that line in future, should occasion so require. The Referees reported that that height would give sufficient headway ; that no evidence was given to show that the Shrewsbury and Hereford Line would require any alteration of its level, and this objection was not valid.

SECT. VIII.

OBSTRUCTION TO VIEW OF SIGNALS AT JUNCTIONS AND
AT STATIONS, AND TO VIEW OF LINE, ETC.

In the *Bedford, Northampton, and Weedon Railway Bill*, 1865, 67, Railway No. 4 would effect a junction with the main line of the London and North Western Railway, near the Castle Station of the latter in Northampton. The line would be made with a curve of 13 chains radius ; and the point of junction would be close to an over-bridge, a few yards only from the station, which bridge it was alleged would prevent the driver of a train coming along the proposed line from seeing into the station. The Referees reported,—“There does not seem to the Referees to be any substantial objection to the engineering of branch No. 4, a proper system of signals being provided.”

Over-bridge.

Preventing view of station.

Over-bridge.

Preventing view of signals.

Over-bridge.

In the *Same Bill, ibid*, the London and North Western objected that, by the manner in which Railway No. 6 proposed to cross their line near their Weedon Station (by an over-bridge), it would offer an additional impediment to that caused by an existing over-bridge to the signals near the station being seen by the driver of a train coming into Weedon from the north ; and it was proposed to deviate the lines, but the Referees reported that this would involve the crossing of a road upon the level, for which no provision had been made in the Bill, and that “The additional impediment to the signals being seen would, in the opinion of the Referees, be very trivial, the signals being at a very considerable elevation.” In the *Crystal Palace New Railways Bill*, 1865, 159, the London, Brighton, and South Coast Railway objected that Railway No. 1 would be carried over the petitioners’ Wimbledon and Croydon Railway at the height of 16 feet 6 inches, and at a distance of about 800 yards from the petitioners’ West Croydon Station, that line

having, at the point of crossing, a curve of $15\frac{1}{4}$ chains radius, and being upon the surface ; and it was alleged that the interposing of a bridge at this point would obstruct the view along this line to the station. The Referees reported—"It will to some extent so obstruct the view, but, in the opinion of the Referees, with ordinary precautions, it will not be any engineering obstacle to the construction of the proposed line." In the *Wrexham Mold and Connah's Quay Bill*, 1865, 260, it was objected that Line No. 2, coming down at a gradient of 1 in 40, would effect a junction with No. 3, on which line the curve at the point of junction was 10 chains, with an inclination of 1 in 80 ; that the lines pass under two roads, and, as the level of the roads was unaltered, it would be necessary to construct bridges which must be continuous and bell-mouthed, equivalent in effect to a tunnel, obscuring the proper working of the lines. The promoters replied that the traffic of the junction would be within proper management with signals, and that in such a country, from the difficult nature of the ground, great reliance must be placed on signals at all junctions ; but that in this case the objection might be partially obviated by straightening the road, and building two bridges instead of one at a distance from each other of about 40 yards. By the Bill a number of other lines were proposed, all of which were objected to. The Referees reported, "that, considering the formation of the country, the nature of the traffic (at the present time wholly mineral), and the complication and number of the existing colliery lines, there are no engineering objections to any of the proposed railways of such a nature as to render their construction undesirable, except Nos. 6 and 7." In the *Same Bill, ibid*, it was alleged that a bridge, carrying line No. 6 over the Minera and Wheatsheaf Railway, would cause a serious obstruction to the view of parts of the existing railway, where there is much traffic, and care is required in its management. The Referees reported that the objection seemed well founded ; but that "it is not deemed that the proposed bridge would cause the obstruction to the

Obstructing view of station.

Bridges.
Obstructing
working of
lines.

Over-bridge.

Obstructing
view of parts
of line.

Over-bridge.
Obscuring
view of line.

view on important parts of the existing lines." And in the *Same Bill* objection was further taken to a proposed bridge over the Ffroed Branch of the existing Wrexham and Minera Line, obscuring the view where there is much mineral traffic, and interfering with the use of some sidings at the point where the bridge crosses the other line. The promoters denied that any inconvenience would occur at this point, as, from the nature of the ground, the most important points would not be obscured. The Referees reported that the evidence on this point was very conflicting ; and, that, from the nature of the country, it was difficult to measure the amount of inconvenience that would be sustained ; that some inconvenience could not fail to occur in the management of the existing traffic, but that it did not appear to them that it would be of a serious nature. In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, a junction with the North Eastern was objected to, on the ground that the point of junction, which would be about 20 chains from the Pickering Station, would be hidden from view from said station by the embankment, upon which another of the promoters' proposed lines there crossed the North Eastern ; but, it having been proved that an opening could be made in the embankment, so as to afford a view of this point of junction, the Referees reported that, with this alteration, there would be no engineering objections. In the *Same Bill*, Railway No. 4 was objected to by the North Eastern, upon the ground that it would cross the petitioners' railway at their Wellington Street Goods Station, Leeds, by a bridge in such a manner as would impede all view of anything descending the petitioners' line—which there descends with a gradient of 1 in 50. But, it was proved, that Railway No. 4 would there be carried upon an open iron viaduct. The Referees reported that there would be no engineering objection upon the grounds alleged. In the *Same Bill*, Railway No. 21, which would form a junction with the North Eastern, was objected to, upon the ground that the point of junction, which would be about half a mile from the Seamer Station,

Junction
hidden by
proposed
embankment.

Bridge
obstructing
view of line.

and the same distance from the Filey Junction of the North Eastern, ought to be effected at the Seamer Station ; and that, if constructed as proposed, it would be hidden from view from said station by the embankment upon which Railway No. 2 there crosses the North Eastern. The Referees reported, that “the effecting of the junction at the Seamer Station would involve the placing the junction where the North Eastern Railway crosses a public road upon the level ; and it was proved, that, by deviating Railway No. 2, and putting an opening in the embankment, upon which it is to cross the North Eastern Railway, a view of both the proposed and the Filey Junctions can be preserved, and with these alterations the Referees are of opinion that there were no engineering objections to the proposed junction.” In the *London, Worcester, and South Wales Railway Bill*, 1865, 86, the Great Western Railway objected that the line crossed their main line by an over-bridge, 14 feet high, 20 yards from the north end of a tunnel of 300 yards, approaching their Worcester Station ; and that the bridge would intercept the view of the signal, which was placed at the south end of the said tunnel, so as to be seen through it. The promoters replied that the signal could not now be seen at a greater distance through the tunnel than the bridge, of the height of 14 feet, would admit ; and that, by placing a repeating signal on the north side of the proposed bridge, greater safety than at present would be attained. The Referees reported that the proposed bridge “would not materially obstruct the signal through the tunnel, and that increased safety would be obtained by having a repeating signal placed north of it.” See also *Hadlow Railway Bill*, 1866, 66, where a junction was proposed with another line at a point only $7\frac{1}{2}$ chains from the mouth of a tunnel ; but there was already a signal station at the mouth of the tunnel, and the Referees reported in favour of the junction : the *Wolverhampton and Bridgnorth Railway Bill*, 1865, 234, where it was objected that a tunnel would intervene between a point of junction and the Bridgnorth Station, the mouth thereof

Junction hidden by embankment.

Over-bridge.

Intercepting view of signals.

Junction near mouth of tunnel.

Tunnel
intervening
between
junction and
station.

Tunnel near
point of
junction.

being 17 chains from the station; but the Referees reported in favour; and also the *Lancashire and Yorkshire Railway (Additional Powers) Bill*, 1865, 239, where the proposed branch entered a tunnel 530 yards in length, about 14 chains from the point of junction with the promoters' main line, which, it was alleged, would render it difficult to see the junction signals. (*Post*, Chap. V.)

CHAPTER III.

INTERFERENCE WITH CANALS.

SECT. I.

INTERFERENCE WITH LAND OF CANAL COMPANY.

As promoters will not be allowed to take the land acquired by other companies for purposes of their own, so they will not be allowed to deprive canal companies (canals, like railways, being undertakings for the public advantage) of land which they themselves require. In the *Chester and West Cheshire Railway Junction Bill*, 1866, 89, it was objected that valuable land on which the wharf of the Shropshire Canal was situated would be taken under the compulsory powers of the Bill. If so, the canal company would be much injured; but the promoters offered not to take any land which would deprive the petitioners of the power to extend their present dock for 80 feet, and to make a road round the south end of the dock so extended, of 12 feet in width. These concessions removed the petitioners' objections, and the Referees reported that there were no objections in an engineering point of view.

II.

PROPOSED LINE RUNNING FOR FIVE MILES BESIDE CANAL,
AND FOR TWO MILES OF THAT DISTANCE BELOW
LEVEL OF THE CANAL.

In the *Brecon and Merthyr Tydfil Junction Railway Bill*, 1865, 425, the proposed line would run along the western side of the Glamorganshire Canal for 3 miles ; it would then be carried under the canal at a depth of 16 feet below the bottom of the water ; and would continue its course on the eastern side below the level of the canal for about 2 miles. The Canal Company and the Taff Vale Railway objected that, in consequence of the porous and shifting nature of the soil, and the frequency of land slips in the Taff Valley, the proximity of the proposed railway to the canal (some of the cuttings being only 50 feet distant from the bank), and the proposed railway being below the level of the canal for about 2 miles, serious danger was to be apprehended to the works of the canal from leakage and from the slipping of the banks, both during the construction of the proposed railway, and also after its completion ; further, that the traffic on the canal must necessarily be stopped during the construction of the proposed bridge under the canal ; and that no provision had been made by the promoters to obviate this difficulty. The promoters replied that, whatever might be the nature of the soil, no danger need arise to the works of the canal, if proper precautions be used in the construction of the proposed line ; that by building retaining walls (for which they had provided in their estimates) in those portions of the line where the railway was in cutting below the level of and close to the banks of the canal, the danger arising from leakage of the water or slipping of the banks would be avoided ; and that, during the construction of the bridge under the canal, no

interference would be caused to the traffic. The Referees reported that "considering the heavy character of the proposed works, and the porous and unstable nature of the soil, more than ordinary care will be required in the construction of the proposed railway; that even under those circumstances the execution of the works will necessitate in certain cases a deviation of the centre line and the construction of retaining walls to a considerable extent (possibly of an aggregate length of 3 miles); but that the execution of the proposed works is a question of expense for which sufficient provision had been made in the estimates."

SECT. III.

INTERFERENCE WITH PASSAGE OF VESSELS TO CANAL.

In the *Bute Docks, Cardiff, (No. 1) Bill*, 1865, 305, the Glamorganshire Canal Company complained that the proposed works would injure the access to their canal, and interfere with the anchorage grounds of vessels. The Referees reported, "That the proposed works might, under certain conditions of wind and tide, slightly interfere with the passage of small vessels to or from the entrance to the Glamorganshire Canal; but that very few and only small vessels ever take such a course as could be so interfered with."

SECT. IV.

INTERFERENCE WITH TOWING PATHS.

In the *Vale of Neath Railway (Swansea Lines, &c.) Bill*, 1865, 367, the Swansea Harbour Trustees complained that the promoters proposed to acquire certain towing-

paths adjoining the Ship Canal at Swansea, used by vessels entering the River Tame and proceeding to the North Dock. The Referees reported, that "it will be necessary that the free use of a towing-path at least 16 feet wide should be preserved to the Harbour Trustees and the public." And in the *Swansea and Clydach Railway Bill*, 1866, 263, it was objected that the proposed railway would interfere with the Swansea Canal, by occupying parts of their property, restricting the towing-path, &c. As to the towing-path, the promoters replied that they proposed to make the towing-path of the uniform width of 6 feet wherever they interfered with it. The Referees reported in favour of the scheme. See also the *Edinburgh and Glasgow (No. 2) Railway Bill*, 1865, 359, *infra*.

The widths of towing-paths must necessarily depend in each case on the requirements of the particular canal. The above cases, however, show that the Referees will take care that towing-paths are not destroyed or unduly restricted.

SECT. V.

HEADWAY AND SPAN OF BRIDGES OVER CANALS.

The Referees will require the span and headway of such bridges to be sufficient for the requirements of the canal; and any undue diminution of the waterway or headway will be accounted an objection in an engineering point of view. In the *Edinburgh and Glasgow Railway (No. 2) Bill*, 1865, 359, the Forth and Clyde Navigation Company objected *inter alia* that the spans (30 feet) of the arches, by which it was proposed to carry the railway over their canal, were insufficient. It was proved that along the petitioners' canal the existing bridges did not exceed 30 feet span. The Referees were of opinion "that the bridges in question ought to be of a span of 36 feet, so as to leave 30 feet of waterway, exclusive of the towing path; and

that with those alterations there will not be any engineering objections to the construction of the railway proposed." In the *Chester and West Cheshire Junction Railway Bill*, 1866, 89, it having been objected that the proposed railway would cross the Shropshire Canal by a bridge of 25 feet span, with a headway of 9 feet, and the promoters having agreed to construct the bridge of 35 feet span, with a headway of 10 feet, the petitioners' objection was withdrawn. And in the *Swansea and Clydach Railway Bill*, 1866, 263, the Swansea Canal Company objected that the proposed railway would occupy parts of their property, contracting the waterway at the points at which the railway would cross the canal. The promoters replied that their bridges over the canal would be of the span of 15 feet, and of 7 feet headway, and would be similar to other bridges over the canal ; and that they were prepared, if necessary, to increase the span of the bridges. The Referees reported that the works were efficient.

As to destroying waterway of a private canal, see *Midland Railway (Branches, &c.) Bill*, 1866, 119, Chap. iv. Sect. i.

SECT. VI.

TUNNELS UNDER CANALS.

See *Brecon and Merthyr Tydfil Junction Railway Bill*, 1865, 425, *supra* Sect ii.

CHAPTER IV.

INTERFERENCE WITH THE PROPERTY OF PRIVATE INDIVIDUALS AND PRIVATE COMPANIES. INTERFERENCE WITH PRIVATE RAILWAYS AND TRAMWAYS.

SECT. I.

INTERFERENCE WITH THE PROPERTY OF PRIVATE INDIVIDUALS AND PRIVATE COMPANIES.

IT has been seen that, as a general rule, where it is proposed to take the land or injuriously affect the line, stations, &c., of another railway, that will be considered an objection in an engineering point of view by the Referees. But this is owing to the public importance attaching to the maintenance and efficiency of a public railway. The rule is otherwise in regard to interference with private property. For this, the remedy provided is compensation. Whether the public importance of the proposed line is sufficiently great to outweigh the private inconvenience resulting from taking compulsorily the property of an individual, is a question of policy, which the Committee on the Bill, and not the Referees, have to consider and determine. It may, therefore, be stated as the general rule, that no matter how great may be the amount of interference with or injury to the property of private individuals, or private companies, the Referees will not consider such interference an objection to the promoters' scheme,—unless, perhaps, in exceptional cases, where it is of public importance that private

rights should be protected. In many cases they have reported (for the information of the Committee on the Bill) the extent and consequences of the interference ; while at the same time reporting favourably of the scheme in an engineering point of view. The cases of this nature are here collected.

In the *Barnet, Hendon, Hampstead, and London Railway Bill*, 1865, 69, the Referees called attention in their report to the fact that one petitioner alleged that he was a lessee for a long term of years, and otherwise beneficially interested in the Belsize Park Estate, which he had laid out in building residences of a first class character ; and of which estate some portion was proposed to be compulsorily taken for the purposes of the undertaking, and the residential character of which would be totally destroyed, to the petitioners' loss and prejudice ; and for which he was advised he had no power of enforcing compensation by law, beyond the injury done to the property actually taken by the railway. And they reported that there was "no valid engineering objection to the proposed railways."

Residential
damage.

In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, the Referees' report bears : "A petition was also presented on behalf of the owners of Ampleforth College, in the county of York ; but the subject of their complaint being, in the opinion of the Referees, rather a question of residential damage, the Referees do not offer any opinion thereon." In the *Same Bill*, an owner of land on the proposed line complained, "that it was proposed to raise a certain bridge, called Monk Bridge, a height of 7 feet, which would cause the approaches to his land to be more steep ;" and he and other owners of land complained that Railway No. 1 would destroy a certain plot of land "which had been laid out for the erection of mills and wharves." The Referees reported that "the matters complained of relate to a claim for compensation, rather than to an engineering defect," and that they did not consider that, so far as this petition was concerned, there were any engineering obstacles to the execution of the proposed railway."

Residential
damage.

Injury to
approaches to
land.

Injury to land
laid out for
mills and
wharves.

Destroying access to estate.

In the *Great Western Railway Bill* (1 S. & G. 124), C. and others objected that the proposed railway joined an existing railway by a junction very near to a level crossing, which was the only means of access to a portion of the petitioners' valuable estate ; and the effect of the two lines being so near, would be that the level crossing would be rendered practically useless. The Referees allowed witnesses to be called and examined as to the practicability of making a bridge under the railways, instead of crossing them by level crossings.

In the *Barnet, Hendon, Hampstead, and London Railway Bill*, 1865, 69, certain petitioners alleged various interests in villa residences on a portion of the proposed line, and that the said line would pass under, injure, and affect the private road by which the petitioners' houses were approached, and injure the sewer connected therewith, and would make an open cutting within a few yards of the several premises, and render them no longer desirable as residences. The promoters undertook so to deviate their line as to interfere as little as possible with certain ornamental planting, and also that much of the line would be in covered cutting, and therefore not detrimental to the petitioners' property. The Referees reported that there were no engineering objections. And in the *Same Bill*, a certain petitioner objected that the line would interfere with certain sewers serving houses on his property ; and that, inasmuch as these sewers were made by him under private roads, also made by him, they were exempted from the 58th section of the Metropolis Local Act. The promoters alleged that a certain vestry were the custodians of these sewers, and that an arrangement had been made by them with the vestry, by which other and equally efficient sewers would be constructed for the use of the petitioners' houses. The Referees reported that there were no engineering objections.

Injury to private road. (a) and sewer. Residential damage.

Injury to sewers.

(a) As to the extent to which promoters may alter the inclinations of private roads in passing under or over them, see General Railways Act, 1845, sects. 49 and 50.

In the *North of England Union Railway Bill*, 1865, 235, the Keld Head Mining Company complained that the proposed railway would pass through their works, take away their water supply, and cut up their dressing floor. It appeared, however, that a very small amount of inconvenience or damage would be caused to the petitioners ; that it was not intended to interfere with the water supply ; and that other dressing floors could be provided upon the premises. The Referees reported that "there are not any engineering objections to carrying the said railway through the said works."

Injury to
works of a
mining com-
pany.

In the *Halesowen and Bromsgrove Branch Railways Bill*, 1866, 235, the New British Iron Company objected that the Railway No. 1 would pass through the middle of their property, taking nearly 5 out of the 11 acres of their spoil land, and interfering with the use of the remainder, and dividing their colliery from the ironworks ; and that, in an engineering point of view, it would be highly objectionable. The Referees reported these facts, and also that the works, in an engineering point of view, were efficient for the objects proposed.

Injury to
works of iron
company.

In the majority of the foregoing cases, the objection of the petitioners was taken to the engineering details alone of the scheme, and not to the sufficiency of the estimate. In all similar cases the objection on the latter ground will no doubt in future be put prominently forward. And in reference to the question of estimate, the 92nd clause of the Lands Clauses Consolidation Act, 1845, should be kept in the view, whereby, if the promoters take part "of any house, or other building or manufactory," the owners may compel them to take the whole. In the last-mentioned case, the estimate was challenged as being insufficient for (among other things) land and buildings ; and the Referees reported that the same was inadequate, "especially for the severance of land and buildings, for which no provision appeared to have been made."

In cases like
the foregoing
estimates may
be challenged.

In the *Glasgow and South Western Railway (Additional Powers) Bill*, 1865, 373, several petitioners com-

Shutting up
street, injury
to individuals.

plained that the stopping up of a certain street would destroy the existing access to their respective premises. The Referees reported that the closing of the street would have the injurious effect upon their respective premises, complained of by the petitioners; and they stated certain details in regard to the accommodation which the several petitioners would receive from a new street which was intended to be provided by the promoters; but they did not report that the interference complained of was an objection in an engineering point of view.

Destroying
waterway of a
private canal.

In the *Midland Railway (Branches, &c.) Bill*, 1866, 119, Lord M. objected "that the proposed railway was to be carried across a canal called the Bilborough Cut, in which the water was of a depth of 4 feet 6 inches, on a close embankment, in such a manner as entirely to destroy the waterway. The Referees' report runs: "The promoters admitted that it was their intention to construct the railway in the manner described. No other matter was brought under the notice of the Referees; and they are of opinion that the works are efficient for the objects proposed in the Bill."

SECT. II.

INTERFERENCE WITH PRIVATE LINES, TRAMWAYS, SIDINGS, ETC.

I.

Follows same general rule as interference with other private property.

As in the case of other private property, so, as a general rule, in the case of private railroads, tramways, &c., no amount of interference will be accounted an objection to the proposed line in an engineering point of view,—the petitioners' remedy being compensation.

The following are cases illustrative of the general principle referred to. In the *Llanelly Railway and Dock (Extension to Mumbles) Bill*, 1865, 494, an individual petitioner complained that a tramway belonging to him "would be interfered with in an objectionable manner." The Referees reported that there would be such an interference with the extension (now in course of construction) of the petitioners' tramway, that such extension could not be effected if the proposed line were constructed ; although they also reported that there were no engineering objections to the proposed scheme. And in the *North British Railway (Carlisle Citadel Station Branch) Bill*, 1865, 297, where the objection was taken that Railway No. 2 would cross a certain siding leading to the Marble-Yard of Messrs. N., and would render the same useless, the Referees considered that "the question is one rather of compensation than engineering." In the *Hull Docks Bill*, 1866, 91, the Referees reported that the tramways, by which certain individual petitioners had access to the River Humber, would be taken for the works proposed by the Bill ; and they at the same time reported that the works were efficient. And in the *Ryde Station and Railway Bill*, 1866, 399, the Ryde Pier Company and the Ryde Commissioners objected to the works. The Referees reported that there were no engineering objections ; and, further, that "should this Bill be sanctioned, the carrying of Railway No. 1 across the authorised Ryde Pier Tramway would render the construction of the latter impossible, unless the Ryde Commissioners consent to the vertical alteration of the level of the said tramway."

Preventing
construction
of tramway
extension.

Destroying
private siding.

Taking pri-
vate tram-
ways.

Preventing
construction
of pier.

II.

Unnecessary or Avoidable interference with Private Lines, &c.

Notwithstanding the general principles above set forth, the Referees have reported unfavourably of the proposed railway, in an engineering point of view, where private property is injuriously affected to an unnecessary or avoidable degree, due regard being had to the public advantage and convenience. In one case, private tramways being injuriously affected by the proposed scheme, and no provisions having been made for remedying the injury by an alteration of the tramway, and no compensation therefor having been provided in the estimate, the Referees reported against the proposed line in an engineering point of view. This was the *South Lancashire Railways and Dock Bill*, 1865, 273, where the lessees of the Ince and Hindley Collieries complained that Railway No. 2 would cut off their access to Top Pit, by crossing their tramway leading to the same, and would cut through and destroy a triple set of sidings now used for marshalling their coal waggons, with a cutting of 3 feet in depth, so as to necessitate the alteration of those lines. The promoters stated that those sidings could be re-arranged; but they admitted that they had not made any provision for such re-arrangement, nor had they made any provision in their estimate for any compensation to the petitioners. The Referees reported that "the proposed mode of dealing with the tramway to the Top Pit, and the marshalling sidings, was defective in an engineering point of view." In the *Afon Valley Railway Bill*, 1865, 315, however, it appeared that Railway No. 2 would cross several mineral tramways belonging to Messrs B., in such a manner that the levels of the said tramways would require to be altered, in order to give sufficient headway for locomotive engines to pass under

Crossing
private
tramway,
and destroy-
ing sidings.

Crossing
mineral
tramways on
level.

them. The promoters admitted that the tramways had been treated as if they were private roads, and that no specific arrangements had been made for the alteration thereof, neither had any sum been included in the estimate for such alteration. The Referees reported that, "The collieries to which the said tramways give access are of considerable value (estimated by the owners as of the value of £50,000), and, unless suitable provision be made for working them, a very heavy sum may have to be paid for compensation for damage thereto. But there are no engineering difficulties in the construction of that part of Railway No. 2."

In the *Bristol and North Somerset Railway (Deviation) Bill*, 1866, 121, the promoters proposed to carry their railway for some distance, parallel to a certain tramway, upon an embankment 22 feet high, and at such a distance that, if the same were constructed with the usual slopes, it would cover the tramway. The promoters undertook to construct a retaining wall, so as not to encroach on the tramway. The Referees reported that "this arrangement will, in the opinion of the Referees, remove all objection."

See also the *South Lancashire Railways and Dock Bill*, 1865, 273 (see *infra*, p. 101), in which case, the promoters proposing to cross a certain tramway leading to a colliery, leaving an insufficient headway, the Referees reported that the proposed mode of crossing was objectionable in an engineering point of view. See *Cannock Chase Railway (Extension) Bill*, and the *Bristol and North Somerset Railway (Deviation) Bill* (see *infra*, p. 102), in both of which cases the promoters having proposed to cross private tramways, leaving insufficient headway, the Referees reported what was the sufficient headway that ought to be provided in each case. See also *Southern Railway Bill* (see *infra*, p. 100), where a level crossing over private lines was sanctioned upon the promoters undertaking to provide gates, gatekeeper, and proper signals.

Interference
with private
tramway by
embankment.

Retaining
wall to be
constructed.

III.

What if Private Sidings interfered with are on Promoters' own Land.

In the *Midland Railway (New Lines, &c.) Bill*, 1865, 223, certain private petitioners objected that Railway No. 14 "will prejudicially affect their land, premises, and works, and will cross, alter, or otherwise affect sidings belonging to and used by them." The proposed railway was a loop line of 7 chains. It would cross at both ends the sidings of the petitioners at their junctions with the Midland Railway; but the Referees reported that "these junctions being formed on the property of the said company, the sidings at the points where they are crossed belong to them. There is no engineering objection to these sidings being crossed as proposed, and the junctions may be easily readjusted."

IV.

Crossing Private Lines, &c., on the Level.

In the *Southam Railway Bill*, 1866, 359, individual petitioners objected that the proposed railway would cross on the level the tramway by which the lime is conveyed from their quarries to their lime kilns. The Referees reported that, "as the promoters have made provision in their estimate for and undertake to have gates, a gate-keeper, and proper signals at this level crossing, the proposed line may be worked with safety, and that the works are efficient in an engineering point of view."

In the *Ogmore Valley Railway (No. 1) Bill*, 1866, 151, certain railway companies urged, among other objections,

that the proposed line would pass across a private railway belonging to Mr. P., on the level where that railway descended on a gradient of 1 in 45. The Referees reported that the works were efficient. In the *Vale of Neath Railway (Swansea Lines, &c.) Bill*, 1865, 367, it was proposed to cross on the level, a low level railway of the Swansea Harbour Trustees, upon which there was a considerable mineral traffic, and which was worked by horses. The Referees reported that the proposed railway was merely a siding into a proposed new goods station ; that trains never could be run over it at any speed ; and that, as the control of the crossing and signals would be in the hands of the petitioners, they were of opinion that there were no engineering objections to the construction of the proposed line.

V.

Headway, Span, Width, &c., of Bridges over and under Private Lines.

In reference to the promoters' powers to alter the gradients of private lines, see provisions of the General Act, 1845 (ss. 49 and 50), cited chap. ii., ss. 6 and 7.

In the *South Lancashire Railways and Dock Bill*, 1865, 273, the lessees of the Ince and Hindley Collieries complained that Railway No. 1 would cut off their access to the Hindley Colliery by crossing their tramway leading to the same, and leaving a length of but 9 feet 9 inches from rail to rail. This tramway was worked with locomotive engines, which could not continue to be used with such a headway. The promoters contended that the tramway might be lowered so as to permit of the passage of locomotive engines. But the Referees reported that it would be doubtful whether such alteration of level could be made legally or physically ; and that the proposed mode of crossing was objectionable in an engineering point of view.

In the *Cannock Chase Extension Bill*, 1866, 116, the Cannock Chase Colliery Company objected that the proposed railway, in crossing over their tramway, would give a headway of 6 feet only, and by so doing, would deprive them of access to their coal-pits with locomotive engines. The promoters contended "that the line of the petitioners was a private one, unauthorised by Parliament, and not within the General Act." It was shown that, by raising the proposed line throughout, and lowering the petitioners' line for its length within the limits of deviation, giving a gradient of not less than 1 in 70, the promoters would be enabled to provide a headway of 14 feet. The Referees reported "that this accommodation should be afforded, and that the engineering details of the undertaking are efficient."

In the *Bristol and North Somerset Railway (Deviation) Bill*, 1866, 121, the promoters proposed to carry their railway over the Somersetshire Canal Company's tramway by an arch 10 feet in span, and with only 10 feet headway. By the promoters' Act of 1863, the line then authorised (for which Railway No. 1 was a substitution) would cross the same tramway by an arch of 12 feet span and 16 feet headway. The Referees reported that a similar arch should be constructed.

SECT. III.

ACCOMMODATION WORKS.

On the subject of the efficiency of proposed works, questions may arise as to the extent to which adjoining owners and occupiers are provided by the promoters with accommodation works. The provisions of the Railways Clauses Act, sect. 68, on this subject, are as follow:—

*Works for
accommoda-
tion of lands.*

"And with respect to works for the accommodation of lands adjoining the railway, be it enacted as follows:—

"The Company shall make, and at all times thereafter maintain, the following works for the accommodation of the owners and occupiers of lands adjoining the railway; that is to say,

"Such and so many convenient gates, bridges, *Gates, bridges, &c.*, arches, culverts, or passages over, under, or by the sides of, or leading to or from the railway, as shall be necessary for the purpose of making good any interruptions caused by the railway to the use of the lands through which the railway shall be made; and such works shall be made forthwith, after the part of the railway passing over such lands shall have been laid out or formed, or during the formation thereof:

"Also sufficient posts, rails, hedges, ditches, mounds, *Fences.* or other fences for separating the land taken for the use of the railway from the adjoining lands not taken, and protecting such lands from trespass, or the cattle of the owners or occupiers thereof from straying thereout, by reason of the railway, together with all necessary gates made to open towards such adjoining lands, and not towards the railway, and all necessary stiles; and such posts, rails, and other fences shall be made forthwith after the taking of any such lands, if the owners thereof shall so require, and the said other works as soon as conveniently may be:

"Also all necessary arches, tunnels, culverts, *Drains.* drains, or other passages, either over or under, or by the sides of the railway, of such dimensions as will be sufficient at all times to convey the water as clearly from the lands lying near or affected by the railway as before the making of the railway, or as nearly so as may be; and such works shall be made from time to time as the railway works proceed:

"Also proper watering places for cattle where, by *Watering places.* reason of the railway, the cattle of any person occupying any lands lying near thereto, shall be deprived of access to their former watering places; and such watering places shall be so made as to be at all times as sufficiently supplied with water as there-

tofore, and as if the railway had not been made, or as nearly so as may be; and the Company shall make all necessary watercourses and drains for the purpose of conveying water to the said watering places:

*Such works
not to obstruct
working of
railway.*

"Provided always, that the Company shall not be required to make such accommodation works in such a manner as would prevent or obstruct the working or using of the railway, nor to make any accommodation works with respect to which the owners and occupiers of the lands shall have agreed to receive, and shall have been paid compensation instead of the making them. (a)

SECT. IV.

ENDANGERING PRIVATE GUNPOWDER MILLS BY PROXIMITY OF LINE.

In the *Caledonian Railway (Balerno and Penicuik Branches) Railway Bill*, 1865, 175, certain gunpowder manufacturers complained of the manner in which the said railway was intended to be carried past their works. To obviate their objections, the promoters agreed that the line should be covered over for some distance whilst passing near and through the said works; and that the extent and manner of executing such covering should be left to the decision of the petitioners' engineer. It appears from a report of the case (1 S. & G. 122), that it was objected before the Referees, on behalf of the promoters, that the petitioners' objection not being one in regard to engineering details, they could not be heard. But the Referees considered this an exceptional case, as the danger concerned the line as well as the petitioners, and the mills were buildings which could not be shifted like an ordinary residence. (b)

(a) See cases cited, *post*, ch. XIII. sect. 11. For corresponding provisions in regard to Scotland, see *Railway Clauses (Scotland) Act*, sect. 60.

(b) As to the extent of the petitioners' right to compensation under the

SECT. V.

INTERFERENCE WITH THE DRAINAGE OF A DISTRICT—DANGER
TO DISTRICT FROM FLOODS THROUGH INSUFFICIENT WATER-
WAY OVER RIVER.

In the *Colnbrook Railway Bill*, 1866, 189, the owners of lands and houses affected by the proposed railways objected that the River Colne would be crossed with an insufficient headway ; and that the drainage of the country to be traversed would be materially interfered with. The Referees reported that the headway and waterway were sufficient ; and that “the railway, if constructed with side-drains of a depth not exceeding that of the bed of the River Colne, and having sufficient outlet, will not interfere with drainage.” The same objection was raised to the *Louth and Lincoln Railway Bill*, 1866, 234, the River Witham Drainage Commissioners contending that by certain bridges to be erected by the promoters over the River Witham and the South Delph, the waterway would be so diminished as to interfere seriously with the drainage of the district. It was, however, agreed between the parties that the accommodation required in respect of the drainage should be referred for settlement to the respective engineers and an umpire ; and the Referees reported that, subject to this proviso, the works were efficient in an engineering point of view.

In the *Hadlow Railway Bill*, 1866, 66, the River Medway Company and the Tonbridge Parish Highway Board objected that by the embankment across the valley of the Medway, as shown on the deposited plans and sections of Railway No 1, the river, in times of flood, would be seriously obstructed to their great injury. The length of the em-

Lands Clauses Act in such a case, see *in re the Stockport, Timperley, and Altringham Railway Company*, 33 Law Journal, Q. B. 251, cited ch. XIV , sect. 5.

bankment was 25 chains; and the promoters proposed to construct 5 bridges, giving an aggregate waterway of 210 feet, the bridge over the main stream being of 40 feet span. It was stated that the aggregate waterway under the road passing through the town of Tonbridge did not exceed 135 feet, and that the floods complained of were to be attributed to sluices, weirs, and other obstructions lower down the river. The Referees reported that, "if an aggregate waterway of 300 feet were provided, the bridge over the Medway not being less than 50 feet span, there would be no engineering objection to the construction of Railway No. 1."

And see *London, Brighton, and South Coast Railway (St. Leonard's Line and Deviations) Bill, 1865, 57, Chap. vi., Sect. iii.*

CHAPTER V.

JUNCTIONS.

SECT. I.

PROVISIONS OF THE GENERAL ACT, 1863.

The 26 & 27 Vict., c. 92, contains certain provisions in regard to junctions, to which it is occasionally necessary to refer in the Courts of the Referees. By sect. ix. it is provided that junctions between a railway and any other railway shall be made under the superintendence and to the reasonable satisfaction of the engineer for the time being of the company or person to whom such other railway belongs. Section xii. provides that the company or person with whose railway the junction is made may from time to time erect such signals and conveniences incident to the junction, either on their or his own lands or on the lands of the company making the junction, and may from time to time appoint and remove such watchmen, switchmen, or other persons, as may be necessary for the prevention of danger to or interference with the traffic at and near the junction ; also, that the working and management of such signals and conveniences, wherever situate, shall be under the exclusive regulation of the company or person with whose railway the junction is made ; and all expenses of erecting and maintaining those signals and conveniences, and of employing those watchmen, switchmen, and other persons, and all incidental current expenses, shall, at the end of each half

Junctions
made under
superinten-
dence of line
joined.

Company
joined may
erect neces-
sary signals,
&c.,

and appoint
watchman, &c.

Management
of signals, &c.,
to be under
control of
Company
joined.

Expense of
signals, watch-
men, and
switchmen to
be borne by
Company
joining.

year, be repaid by the company making the junction, and in default thereof may be recovered from them in any court of competent jurisdiction.

SECT. II.

JUNCTIONS ON IRRECONCILEABLE GRADIENTS.

In the *Poole and Bournemouth Railway Bill*, 1865, 53, the London and South Western Railway objected to a proposed junction with their Southampton and Dorchester Line. The proposed line would approach the latter (which at the point of junction is on a gradient of 1 in 348) with a rising gradient of 1 in 60; and, as it was proposed to effect the junction with a curve of 70 chains radius, which would require a space of 6 chains for the works of the junction, such junction, if made at the point specified in the plan, would be effected partly upon the gradient of 1 in 60, which was irreconcileable with the gradient (1 in 348) of the line to be joined. In order to obviate this objection, the promoters proposed to alter the curve at the actual junction to one of 15 chains radius; but the Referees reported that this "could not be done, having regard to the 14th section of the Railways Clauses Consolidation Act, without the consent of the Board of Trade (a)." And we are of opinion that the proposed junction is bad in an engineering point of view." In the *Tottenham and Hampstead Junction Railway (New Lines) Bill*, 1865, 128, the opponents alleged that, "owing to the great difference in the gradients at the proposed point of junction between the intended line, as shown on the plans, and the railway with which it was

(a) Sect. 14 provides, that "it shall be lawful for the company to diminish the radius of any curve described in the said plan, to any extent which shall have a radius of not less than half a mile, or to any further extent authorised by such certificate, as aforesaid, from the Board of Trade."

to communicate, such a junction would be impracticable." The Referees reported that the evidence fully sustained the objection ; and that " no other mode of effecting a junction, consistent with the provisions of the Bill and the powers of the company, was shown to them to be practicable." In the *Swansea and Aberystwith Junction Railway Bill*, 1865, 419, the objection was taken that the proposed junction of Railway No. 3 with the authorised line of the Swansea and Aberystwith Railway could not be formed under the powers of the Bill. As the gradients of both these lines were 1 in 125, the gradients of both the lines falling in opposite directions towards the point of junction, the promoters admitted that the junction could not be formed according to the sections on the deposited plans ; but they maintained that the gradients of the proposed line might be altered under the powers of the Railway Clauses Act, so as to enable the junction to be made. On this point, however, the Referees reported that " the junction of the proposed railway with the Swansea and Aberystwith Railway cannot be made according to the deposited plans." In the *Ogmore Valley Railways (No. 1) Bill*, 1865, 420, it was objected that Railway No. 3, at the junction with the Ely Valley Railway, could not be made according to the deposited plans. The Referees reported that the line " could not be made at the point of junction under the powers of the Bill ;" but no reasons are stated.

All objections of this nature may, however, be obviated, within the limits of deviation, by alteration of the intended gradients. Thus, in the *Wrexham, Mold, and Connah's Quay Railway Bill*, 1865, 260, Railway No. 4 would join Railway No. 7, where both were upon steep gradients, the former on a curve of 20 chains and a gradient of 1 in 50, and the latter on a curve of 10 chains and a gradient of 1 in 18.63. Such a junction was objected to as impracticable. It was stated that, according to the plan, one would project over the other. The Referees reported, " The promoters reply, and there seems no reason to doubt, that the objection may be obviated within the limits of

deviation by a slight rise in the level of No. 4, or by continuing both lines on the same level until they are clear of each other. In either case the gradients would not be sharpened to any perceptible extent." In the *Newport and Usk Railway Bill*, 1865, 299, the Monmouthshire Railway, &c., Company objected to a proposed junction with their Eastern Valleys Line, as interfering prejudicially with their works. On the deposited plans, the proposed line was shown to be level for 6 chains up to the point of the completion of the junction ; but, inasmuch, as the Monmouthshire line is there upon a gradient of 1 in 273, it would be impossible to effect the junction without making the proposed railway conform to the Monmouthshire Railway for a distance of about 200 feet. The Referees reported that this could be done without difficulty. In the *Afon Valley Railway Bill*, 1865, 315, the Referees reported that "it will be impossible to effect the junction of Railway No. 2 with the Llynvi Valley Railway, in the precise manner shown on the deposited plan, inasmuch as the proposed railway is thereby shown to be on a gradient of 1 in 40 up to the point of the completion of the junction, the Llynvi being there level for 130 feet before such completion. To obviate this difficulty, it has been proposed to push back the entire inclined part of Railway No. 2 (which is 2 miles long) about 130 feet. This would lower the level of the same 4 feet at the first point of junction with the Llynvi Valley Railway, and would increase the depth of the cuttings by that amount. But this would not add to the cost of construction, as the amount of the embankment thereon is in excess of the cutting."(a) In the *Bromyard and Hereford Railway Bill*, 1866, 88, the Great Western objected to three different junctions, on the ground of incompatibility of gradient, and to three other junctions, on the question of curves, as not being capable of construction in accordance with the deposited plans. The Referees reported that, "Evidence was given to show that the

(a) For a further objection to the junction, as proposed to be amended, see *post*, as to BLINDSIDING

necessary alterations could be made within the limits of deviation." In the *Croydon, Mitcham, and Kingston Railway Bill*, 1866, 92, the Referees reported that "It was admitted that certain objections taken to the junctions on Railways Nos. 2, 3, and 5, might be obviated within the powers of the General Act;" and, also, that the works were efficient. In the *Brixton, Clapham, and Balham Junction Railway Bill*, 1866, 165, it was objected that the junction of Railway No. 4 with the London, Chatham, and Dover (Metropolitan Extension) Line could not be effected within the statutory powers, the gradients being respectively 1 in 80 and 1 in 100. The promoters stated in reply that, by lowering the line at Acre Lane, the gradient of 1 in 80, of Railway No. 4, at the point of junction, could be so altered within the powers of the General Act as to make the junction in an efficient manner. The Referees reported that the works were efficient. And in the *London, Chatham, and Dover and South Eastern (Bromley, Farnborough, and West Wickham) Railways Bill*, 1866, 315, the London, Brighton, and South Coast Railway objected to several junctions in the proposed railways, as being "laid out in the deposited plans with incompatible gradients;" but the Referees reported that, "as the junctions could be efficiently made within the limits of deviation, both lateral and vertical, the objections are not valid."

SECT. III.

JUNCTIONS ON STEEP GRADIENTS AND SHARP CURVES—NO INTERVENING LEVEL SPACE FOR STANDAGE, ETC.

In the *South Lancashire Railways and Dock Bill*, 1865, 273, the London and North Western Railway objected to a proposed junction which Railway No. 3 (commencing by a junction with Railway No. 1) would form with their North Union Line. The proposed junction line would

be on a gradient of 1 in 88, descending towards the latter line, which is there very much crowded with traffic, and without any level space intervening between the said gradient and the point of junction. The Referees reported that, "this mode of junction the Referees, under the circumstances, consider highly objectionable in an engineering point of view;" further, that the promoters had replied that the requisite level space could be procured by moving the point of junction with line No. 1 further back upon that line. The Referees reported that the sections, as shown upon the deposited plans, do not show any such level space; and the Referees cannot decide whether or not the promoters had such power to alter the point of junction with their own line No. 1." In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, it was objected that Railway No. 9 would effect a junction near the Wetherby Station with the North Eastern Railway, upon a gradient of 1 in 66, rising towards the latter line, without the intervention of any level space upon which a train could stand; nor were any sidings provided for standage at this point of junction. The Referees reported "that whilst there are no engineering obstacles to the effecting of a junction as proposed, it is a defect that no standage is provided, nor are any powers taken to run into the North Eastern sidings at the Wetherby Station." Several of the other lines proposed by the Bill were also objected to for like reasons. The Referees reported that "The same defect, as to the absence of any provision for standage at the several points of junction, applies to the several railways, Nos. 10, 11, 12, 13, 20, and 21, in manner similar to that mentioned in respect of Railway No. 9;" and that, without these matters being provided for, the intended works would not be efficient (see more fully Ch. IX., § 1.)

In the following cases, junctions on steep gradients and on sharp curves were allowed:—

In the *Barnet, Hendon, Hampstead, and London Railway Bill*, 1865, 69, the Edgware, Highgate, and

London Railway objected to the proposed junction at Barnet with the Barnet Branch of the Great Northern, by a curve of 10 chains radius, from a rising gradient of 1 in 65 on the proposed line, at a point where the Barnet Branch had a falling gradient of 1 in 40. They also objected to the proposed junction at Finchley with their authorised line by an ascending gradient of 1 in 57 for 28 chains, and at a point intermediate between the Mill Hill and Finchley Stations. The promoters replied that the Barnet junction was for a short distance on a gradient of 1 in 200, and it was proposed to be used only as a coal line, though, if necessary, it might be used as a passenger communication with safety; and that the Finchley Junction, as proposed, would join the petitioners' line on a gradient of 1 in 127, and on a curve of 18 chains radius; and that there was room to construct a station on the promoters' line. The Referees reported that there was "no valid engineering objection." In the *Same Bill* it was also objected that Line No. 1 joined the sidings of the London and North Western Railway, which were already overloaded with traffic, on a falling gradient of 1 in 60, and on a curve of 15 chains radius on a siding of that company's line. The promoters replied that this junction was "the best practicable, being in the open at the end of Primrose Tunnel, pointing towards London, and on sidings of considerable extent;" and also that "the complicated arrangement of railways in London made this junction in the open on the sidings of the London and North Western better than a junction with the main line." The Referees reported that there was "no valid engineering objection." In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, a proposed junction of Railway No. 8 with the North Eastern at Leeds was objected to, upon the ground that it would be effected where the latter line was upon a gradient of 1 in 104, and the proposed line would be upon a gradient of 108, without the intervention of any level space. The Referees reported that, "under all the circumstances attending the Leeds Central Station, there are no engineering

objections to effecting the junction in the manner proposed.” In the *Lancashire and Yorkshire Railway (Additional Powers) Bill*, 1865, 239, the junction of the proposed Rippenden Branch would be effected with the main line of the Lancashire and Yorkshire Railway, east of Sowerby Road Station, and about 30 chains distant from the present goods station, on a curve of 10 chains radius, and on a falling gradient of 1 in 102, and at a point where the main line of the Lancashire and Yorkshire Railway leaves a cutting and enters on an embankment; and that the branch enters a tunnel, 530 yards in length, about 14 chains from the junction, which would render it difficult to see the junction signals. The promoters replied that it was intended to enlarge the present goods station at Sowerby Bridge Road, and extend it up to the proposed point of junction with the Rippenden Branch; that the gradient of the main line was 1 in 260; and that there was no danger of the signals not being seen, as the branch runs straight from the junction for a considerable distance, and a person might see the station signals from the further end of the tunnel; and that there would be no quick traffic on this branch, it being less than 3 miles in length. The Referees reported that “on consideration of all the evidence given, they were of opinion that there existed no engineering objections to the junctions as proposed, and that they might be safely made.” In the *Brecon and Merthyr Tydfil Junction Railway Bill*, 1865, 425, the proposed junction with the Aberdare Branch of the Great Western was objected to, on the ground that the point of junction was at the end of a viaduct, and on a curve of 10 chains radius (the proposed line being for the greater part of that curve in cutting); and that this was an improper curve on which to approach a junction. The promoters contended that the curve of 10 chains radius was not one of unusual severity; that, without making a new viaduct or altering the canal, no better junction could be made; and that the objection to the line being in cutting on a curve would be in part removed by constructing sidings therein, which would open and improve it. The Referees reported that “although there is no engineering objection”

to this junction, "yet, owing to the position of the viaduct, and the radius of the junction curve, great care will be required in working the traffic at this point."

In the *East London (South Western Extension) Bill*, 1866, 167, a junction with the authorised East London Railway was objected to, on the ground that it was on a curve of 12 chains, with a falling gradient of 1 in 61. The Referees reported that there was no objection in an engineering point of view to his junction. In the *City, Kingston, and Richmond Railway Bill*, 1866, 177, it was objected that No. 3 would effect a junction with Railway No. 1 with a curve of 10 chains, a descending gradient of 1 in 84, and close to the north side of the embankment of the Brighton and South Coast Railway, through which Railway No. 1 passes. It was also objected that Railway No. 4 would effect a junction with Railway No. 1 with a like curve of 10 chains, a descending gradient of 1 in 79, and close to the south side of the same embankment. The Referees reported that, "considering the circumstances of the case, those junctions are not defective in an engineering point of view."

In the *Chipping Norton, Banbury, and East and West Junction Railway Bill*, 1865, 195, the Referees reported that, "It was objected to Railway No. 2 that it effects a junction with a siding of the Great Western Railway at Banbury, and, after a level space of 8 chains, passes upon a gradient of 1 in 80 (falling towards the station) with a curve of 20 chains radius over the Great Western Railway," and that "This mode of junction is not, in the opinion of the Referees, objectionable."

In the *Hadlow Railway Bill*, 1866, 66, the South Eastern objected to a proposed junction of Railway No. 2 with their Tonbridge Wells Branch, "as being on a gradient of 1 in 100, and at a point only $7\frac{1}{2}$ chains from the mouth of the tunnel." It was shown that the gradient between the proposed junction and Tonbridge Wells was generally 1 in 100, and that there was already a signal station at the mouth of the tunnel. Upon these grounds the Referees reported that there was no engineering objection to the junction.

In the *Lancashire and Yorkshire Railway (West Riding Branches) Bill*, 1866, 161, it was objected that the proposed line descended on a gradient of 1 in 70, to its point of junction with the existing line of the Lancashire and Yorkshire Railway at Elland. The Referees reported that, "This gradient is steep, but not so steep as existing junctions upon lines in the same neighbourhood, which have been worked with safety for many years; and, considering the nature of the country, the Referees are of opinion that it is not defective in an engineering point of view."

In the *Greenock and Ayrshire Railway Bill*, 1866, 287, it was objected that both the junctions of No. 3, viz., that with the promoters' authorised line on gradients both of 1 in 70, and that with the existing Greenock and Wemyss Bay Railway, on gradients of 1 in 70, and 1 in $67\frac{1}{3}$, would be objectionable and dangerous. The Referees objected "that similar junctions are with ordinary care worked without danger or accident, and that the petitioners' objections in these respects are not valid."

In the following cases the 'petitioners' objections were obviated within the limits of deviation:—In the *Havant, Hambleton, and Droxford Railway Bill*, 1865, 45, it was proposed to form a junction of the promoters' line with the authorised line of the Petersfield and Bishops Waltham Railway, near Droxford. This junction was to be effected on a long gradient of the latter line of 1 in 80, falling towards Meonstoke. The promoters proved that the limits of deviation at the junction were large enough to admit of the junction being made lower down on the gradient of 1 in 80 of the petitioners' line, within 12 chains of the foot of the incline; and that such a junction would enable the promoters to enlarge the piece of level of their line, on which the junction would partially be formed, from 100 to 232 yards and upwards. The Referees reported that this was preferable to the original proposal in an engineering point of view. In the *North of England Union Railway Bill*, 1865, 235, the Referees reported that Railway No. 2, in approaching the London and North Western Railway to

effect a junction therewith, descended for a distance of 1 mile, with a gradient of 1 in 70, then was level for $5\frac{1}{2}$ chains up to the point of junction ; but that, inasmuch as the London and North Western Railway was there upon a gradient of 1 in 100, descending towards the junction, in order to effect the junction it would be necessary to lower the level space 16 inches, and so to reduce the extent of the level space, but that the extent of level space could be recovered by moving the inclines of 1 in 70 and 1 in 160 backward upon an adjacent level space ; and that the junction proposed could be so effected, and there would not be any engineering objection thereto. In the *Wrexham, Mold, and Connah's Quay Railway Bill*, 1865, 260, it was objected that Railway No. 1 would join the existing Mold Branch of the Chester and Holyhead Line, at a point where the latter is on a gradient of 1 in 55 and the former 1 in 60, both descending. There was a level piece at the point of junction of 100 yards on Railway No. 1 ; but one-half of this was on the existing line of the Mold and Chester Railway. These steep gradients extended, in the one case, to half-a-mile ; and, in the other, to three quarters of a mile, from the point of junction. The promoters admitted that the line, as laid out, "would require caution in working the traffic ;" and it was proposed to obviate the objection by enlarging the piece of level at the point of junction, or by giving a gradient of 1 in 300 for 240 yards, and lowering the proposed line from the top of the inclination 5 feet, involving an increase in the depth of the cutting of from 15 to 20 feet. The gradient in that case would remain the same. The Referees reported that "this alteration, which is within the limits of deviation, would be a great improvement on the plan at first proposed. But even with this alteration care would be required in managing the traffic at this point." In the *Vale of Crickhowell Railway (Western Extension) Bill*, 1865, 368, the junctions proposed to be effected by a double fork at the Talybont Station of the Brecon and Merthyr Railway, were objected to. The southern fork would effect its junction "at some distance

from the foot of an incline of 1 in 39 ($6\frac{3}{4}$ miles in length) on the Brecon Railway;" and the northern fork would effect its junction "at some distance from the foot of an incline of 1 in 40 (of $1\frac{3}{4}$ mile in length) on said railway." The space intervening between those inclines for 29 chains was upon a gradient of 1 in 300, and upon this space the Talybont Station was placed. The Referees reported that "it would be desirable, if possible, to avoid effecting a junction with a railway so near to such long and steep inclines as those upon the Brecon and Merthyr Railway; but, from the nature of the country, if a junction is to be effected, it cannot be made without some such defect; and as the control of the trains and signals will be vested in the Brecon and Merthyr Company, the Referees are of opinion that there are not any engineering objections to the construction of the proposed junctions."

SECT. IV.

IN WHAT EXCEPTIONAL CASES JUNCTIONS ON STEEP GRADIENTS AND SHARP CURVES ARE USUALLY ALLOWED.

I.

*Where the Junction is with a Line of the Promoters' own,
or worked by them, or where Proposed Line will be
worked by the Line to be joined.*

In the *North British Railway (Lasswade, &c. Branches) Bill*, 1865, 174, on the petition of the Caledonian Railway, the Referees reported that the junctions were "open to some objection, in one case being effected where the lines are upon a gradient of 1 in 50; but the junctions are effected with lines belonging to the same owners, and, in some cases, the lines are continued parallel to each other, so as to secure a moderate gradient before effecting the junction. The Referees therefore do not consider the

junctions objectionable in an engineering point of view." In the *Caledonian Railway (Balerno and Penicuik Branches) Bill*, 1865, 175, the North British Railway complained of the manner in which the junction near the Slateford Station is intended to be effected viz., within 10 chains of the foot of a descending gradient of 1 in 110. The Referees reported that having regard to the fact that the junction was to be effected with the line of the Caledonian Railway, and that the signals were entirely under their control, they were of opinion that there were no engineering obstacles to the effecting of the junction in the manner proposed. In the *Wolverhampton and Bridgnorth Railway Bill*, 1865, 234, it was objected that the junction with the Severn Valley Railway, which is there a single line, was to be effected at a distance of $1\frac{1}{2}$ miles from the Bridgnorth Station, where the proposed line would be upon a descending gradient of 1 in 156, the Severn Valley Railway there being upon a gradient of 1 in 264 rising towards the station ; that a tunnel above 500 yards in length would intervene between said junction and the station, the mouth thereof being 17 chains from the station ; and that upon said line there were gradients of 1 in 66 for 1 mile, of 1 in 70 for 2 miles 28 chains, and of 1 in 80 for $1\frac{1}{2}$ miles. The Referees reported that "the junction in question is to be effected with a line which has been for sometime worked without any difficulty. It is to be worked by the same company ; and the Referees do not consider that there are any engineering objections to the construction of the proposed line." In the *North British Railway (Glasgow Branches) Bill*, 1866, 221, the City of Glasgow Union Railway objected that the junction of Railway No. 7 with the existing North British Railway would be placed at such a distance from the junction of the petitioners' authorised railway with the same line as to cause unnecessary difficulty in the system of signals. The promoters stated in reply, "that the proposed junction would be unobjectionable, inasmuch as it would be made with their own railway, and would be under the control of the same company. See also *London*,

Brighton, and South Coast Railway (Additional powers) Bill, 1865, 143, cited, post, p. 128.

In the *Great Northern Railway (Potter's Bar, Barnet and Hendon) Bill, 1866, 194*, the Edgware, Highgate, and London Railway objected that the junction with their line "was inconveniently placed;" but the Referees reported that "inasmuch as this latter railway is leased for 999 years to the promoters, and is to be worked by them, the Referees are of opinion that the objection is not valid."

II.

Where the signals at the point of junction will be in the hands of the Company to be joined. (a)

In the *Maidstone and Ashford Railway Bill, 1866, 65*, the South Eastern Railway having objected to a proposed junction with their line at Ashford, the Referees reported "The signals will be under the control of the South Eastern Company. The Referees think that, with ordinary caution, the proposed junction may be worked with safety and efficiency." In the *Barry Railway (Penarth and Cardiff Extension) Bill, 1866, 132*, the Taff Valley Railway, as lessees of the Penarth Railways Harbour and Docks, alleged that the junction, by which it was proposed that the intended railway should join the Penarth Railway, was inconvenient and dangerous, and bad in an engineering point of view. The Penarth Railway is a mineral line, upon which there is a dépôt, from whence the coal brought from the surrounding district is forwarded to either side of the Penarth Dock by two branches, and the proposed junction was to be effected with the western branch at a point close to the fork and near to the dépôt. The promoters stated that the junction could be made without difficulty

(a) See 26 & 27 Vict. c. 92, sect. 12, cited *ante*, p. 107.

or danger ; and that there was no point on the petitioners' railway, within the limits of deviation, at which it could be better effected. It was shown that the proposed railway, by forming the junction at the point described, would interfere only with the working of the Western Branch of the petitioners' railway, by which but one side of the Penarth Dock is served ; whereas, by a junction at any other point, the whole working of the dépôt above alluded to would be impeded ; and that, by effecting the junction in the mode proposed, both railways would be under the control of the same system of signals. The Referees reported that there was no engineering objection to the proposed junction. And in the *Glasgow and South Western Railway (Additional Powers) Bill*, 1866, 192, the Caledonian Railway objected that where a junction was proposed to be effected with their line, trains at certain times follow each other at very short intervals, and that it would be dangerous to allow trains coming from the north to cross the western or down line of the Caledonian Railway, in order to get on the proposed line. The Referees reported that the signals would all be under the control of the Caledonian Railway Company, and there would not be any engineering objection.

See also *Vale of Crickhowell Railway (Western Extension) Bill*, 1865, 368, cited p. 117.

III.

Where trains already have to slow at the proposed point of junction.

This may arise either from proximity to stations or other causes. In the *Chipping, Norton, Banbury, and East and West Junction Railway Bill*, 1865, 195, a junction

with the authorised East and West Junction line near Canons Ashby, was objected to on the ground that the proposed line would be upon a gradient of 1 in 79, falling towards the point of junction, with only 6 chains of level before effecting the junction. The Referees reported that, "as the junction would be near the proposed station of the East and West Junction Line, where the speed of trains must necessarily be slow, with ordinary precautions there would be no engineering objections to this junction." And in the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, it was objected that Railway No. 5, terminating by a junction with the Leeds, Bradford, and Halifax Railway, would be dangerous, inasmuch as the latter line, at the point of junction, was upon a gradient of 1 in 50 descending towards the station; and that the introduction of facing points upon such a gradient would be attended with danger. The Referees reported that "the introducing facing points and forming a junction upon such a gradient is objectionable; but upon considering the character of the Leeds Station, and that the speed of trains must be slow at the point of junction, the junction in question may be sanctioned." In the *Birkenhead and Liverpool Railway Bill*, 1865, 285, a junction, proposed to be made by No. 2 Railway (which would be upon a descending gradient of 1 in 52) with No. 1 Railway (which would be upon a descending gradient of 1 in 47), both lines being there upon curves of 20 chains radius, was objected to. The Referees reported that "under the peculiar circumstances of this case, this junction is not objectionable in an engineering point of view, the more especially as it is near to the station, and the working of it will be controlled by the telegraph."

See also the *Lancashire and Yorkshire Railway (Additional Powers) Bill*, 1865, 239, cited p. 114.

IV.

Where the lines are entirely mineral.

This was one element taken into consideration by the Referees in the *Wrexham, Mold, and Connah's Quay Railway Bill*, 1865, 262, where a number of objections were taken to junctions, &c., on lines Nos. 1, 2, 3, 4, and 5; and the Referees reported that there were no engineering objections, "considering the formation of the country, the nature of the traffic—at the present time mineral—and the complication, and number of the existing colliery lines." In the *North British Railway (Camps, &c., Branches) Bill*, 1866, 375, the Caledonian Railway having objected that Railway No. 2 would be carried across their line on the level, the Referees reported that, as both lines were purely mineral, and could not have any great traffic, there would be no serious engineering objection. And see also the *London and North Western and Midland Counties Coal Fields Railway Bill*, 1866, 195, where a crossing on the level over another line was allowed, on the ground that the line to be crossed was only used for "slow goods traffic" (*ante*, p. 63).

SECT. V.

MULTIPLICITY OF JUNCTIONS IN ONE PLACE.

The expediency and safety of several junctions in contiguity must necessarily depend very much on the circumstances of each case. Occasions may, however, occur when the following instances may prove useful for reference. In the *Wrexham, Mold, and Connah's Quay Railway Bill*, 1865, 260, the junction, at the Wrexham Station, of Line

Four existing lines at point.

No. 4 with the promoters' authorised line from Wrexham to Whitchurch was objected to, as increasing an inconvenience and complication already considerable. It appeared that there were already four existing or authorised lines in the neighbourhood, converging to the Wrexham Station; and, if a fifth were sanctioned, there would be five sets of points. The promoters answered that "the junction, which one of their authorised lines made with the Great Western, was so complained of, that power had been taken last session to make a line passing behind the station, avoiding the rails and platform, and superseding one of the junctions complained of." The Referees reported, "It was admitted by the petitioners that this plan, if carried out, would obviate the particular objection as to the number of junctions." In the *Croydon, Mitcham, and Kingston Railway Bill*, 1866, 92, it was objected that Railway No. 1

formed a treble junction with the Wimbledon and Croydon and South London, Tooting, and Sutton Junction Railways, and crossed the line of the former nearly at right angles. The promoters stated that it was intended to erect a station, with the proper signals, at this point. The Referees reported that the proposed junction could be worked with safety and efficiency. And in the *Llantrissart and Taff Vale Junction Railway Bill*, 1866,

Four junctions within 30 chains.

153, it was objected that Railways 1, 3, and 4 would make four junctions, within a distance of 30 chains, at the place where the Llantrissart and Taff Vale Junction Railway and the Llantrissart Common Branch are to be joined." The promoters replied that these junctions were necessary, and that they could not be effected in a better or more convenient manner. The Referees reported that the works would be efficient.

SECT. VI.

JUNCTIONS IMPRACTICABLE BECAUSE THE TWO LINES NOT ON
SAME LEVEL AT POINT OF JUNCTION.

It is obvious that, in order to effect a junction with another line, the proposed railway must, at the point of junction, be on the same level as that line. In many cases, before the Referees, it has turned out that, either from oversight or otherwise, this important matter has not been sufficiently attended to, and it has happened that, at the point of junction, the proposed line would, according to the deposited plans, be many feet higher or lower than the line intended to be joined. If the difference of level is so great that it cannot be got over by the vertical deviation allowed by the General Act (Sect. xiv.) the junction becomes absolutely impracticable and objectionable in an engineering point of view. In the *Glasgow City, Suburban, and Harbour Railway Bill*, 1865, 186, the City of Glasgow Union Railway objected that a junction was proposed on their line at a point, between their goods and passenger stations, where they proposed to lay four lines of railway, and that, at the point of junction, "there was a difference of levels, before the two lines could clear each other, of between 2 and 3 feet, and that according to the deposited plans the junction was impracticable. The promoters replied that the junction could be made by carrying it to the extreme point of the limits of deviation on land scheduled, and by raising their line to an extent not exceeding the limits laid down in the General Act. The Referees reported that "the junction with the petitioners' railway could not be constructed under the powers of the Bill." In the *Brecon and Merthyr Tydfil Junction Railway Bill*, 1865, 425, a proposed junction with the authorized Brecon and Merthyr Tydfil Railway was objected to, "inasmuch as the point of junction corresponds with the limits of deviation, and as

there is a difference at that point of 2 feet 6 inches in level between the proposed railway and the authorised Brecon and Merthyr Railway, "a practicable junction cannot be made within the limits of deviation shown upon the deposited plans and sections." The promoters answered that, although impracticable, as shown on the deposited plans, the junction could be effected under the powers of the Bill and of the Act of the authorised Brecon and Merthyr Railway. In regard to this objection, the Referees reported that the junction "cannot be effected under the powers of the Bill." And in the *Manchester, Sheffield, and Lincolnshire Railway (Central Station and Lines) Bill*, 1866, 261, the promoters represented that by agreement with the Midland Railway it had been arranged that Railway No. 3 should be constructed only up to a certain point, and that a junction should there be effected with the authorised Midland Line, and that the remainder of No 3 should be abandoned. It was admitted that at the point in question No 3 would be 3 feet 3 inches above the level of the authorised Midland Line. The Referees reported, "This difference of level will render the junction at the point proposed impracticable; and in such case the railway would not be efficient for the objects proposed."(a)

SECT. VII.

JUNCTIONS WITH CROWDED MAIN LINES OR CROSSING SAME ON LEVEL.

I.

These are in general objectionable.

In the *Bedford, Northampton, and Weedon Railway Bill*, 1865, 67, a junction was proposed to be made by a

(a) For further objections in this case, see p. 25.

double or S curve to the London and North Western Railway Station at Weedon, the curves to be of $13\frac{1}{2}$ chains radius, with a gradient of 1 in 96, descending towards the station, and chiefly in deep cutting. It was proved that there were 23 passenger trains and 72 goods trains daily passing through Weedon Station without stopping. The Referees reported that, having regard to this fact, as well as to the nature of the works upon this branch, this junction ought not to be permitted with the main line, but ought to be made either into the existing sidings of the London and North Western Railway, or into sidings to be constructed by the promoters, and for the making of which they have scheduled sufficient land. The Referees further reported that Railway No. 9, which was the other fork of the above-mentioned junction, ought, for the same reasons, if permitted, to be made into sidings and not into the main line of the London and North Western Railway. In the *East London Railway Bill*, 1865, 113, the object of the promoters was the construction of railways to connect, by means of the Thames Tunnel, certain railways on the north side of the Thames with certain others on the south side. It was proposed by Railway No. 1 to effect a junction with the main down line of the London, Brighton, and South Coast Railway, at a point about 200 yards on the north side of New Cross Station ; and it was also proposed by Railway No. 4 (a spur of No. 1) to effect a junction with the main up line of the same railway at the same point. At the proposed point of junction, the London, Brighton, and South Coast Railway consists of four lines of rails, the two inner lines of rails being devoted to the through traffic, and the two outer lines being appropriated to the local traffic of the Brighton Line. The South Eastern, who enjoy running powers over these main lines, daily run 18 passenger and 7 goods trains upon the main down line, and an equal number of trains upon the main up line. The Brighton Company daily run 18 passenger and 8 goods trains upon the same main down line, and an equal number of trains on the main up line. None of these main line trains stop at

New Cross Station ; and some of them run past the proposed point of junction at a speed of 40 miles an hour. On the down local line the Brighton Company, on ordinary occasions, run daily 79 passenger and 2 goods trains, and an equal number on the up local line ; and upon the same lines the South Eastern run daily 19 passenger and 5 goods trains upon the up, and 18 passenger and 7 goods trains upon the down line. Some of these local trains follow each other at an interval of only three minutes. The promoters' lines would cross those local lines upon the level to effect the proposed junctions with the main lines. The Referees reported that "the proposed junctions could be physically effected ; but, having regard to the very crowded state of the traffic on both the local and main lines, the Referees are of opinion that, whilst it is most desirable that facilities for effecting the connection proposed by the promoters should be afforded, it is very questionable if the junctions proposed should be allowed ; and they are of opinion that the mode of junction, if any be allowed, should be determined by the Board of Trade ;" and that the promoters had expressed their willingness to assent to this.

II.

But not objectionable when with Promoters' own Line.

In the *London, Brighton, and South Coast Railway (Additional Powers) Bill*, 1865, 143, it was proposed to effect junctions with the up and the down main lines of the promoters' railway at a point about 10 chains to the London side of the New Cross Station, and in a manner precisely similar to the scheme of the East London Railway (*supra*), the point of junction in the present instance being somewhat nearer the station. In the present case, as in the other, the local lines would be crossed on the level, in order to get to the main lines. The Referees in their report

quote the evidence laid before them in the case of the East London Line, and added, "But in the present case the junctions are proposed to be effected with the promoters' own lines. They have entire control over the signals thereon ; and they state that the objects of those junctions is to take traffic off their main lines to London Bridge, and transfer it to their South London Line ; and by means thereof to obtain access to the Farringdon Street Station of the London, Chatham, and Dover Railway. Under these circumstances, the Referees are of opinion that, with proper precautions, there are no engineering objections to effecting the proposed junctions." In the *Same Bill* it was also proposed to form a short junction railway to connect the promoters' South London Line with their main line near the bridge carrying the main line over the Grand Surrey Canal. The main line, at the proposed point of junction, consisted of three lines ;—two used in common by the promoters and the South Eastern for their through traffic, and one used by the promoters for their local traffic. There are daily 159 trains running upon the down main line, 77 trains upon the up main line, and 78 trains running upwards upon the local line. To effect the proposed junction with the main lines, it would be necessary to cross the local line upon the level. The Referees reported that the proposed junction with so crowded a line must be attended with a certain amount of danger ; but, considering that the junction was to be effected with lines belonging to the promoters themselves, that the signals there were all under their own control, and that the object of the junction was to take some of the traffic to London Bridge off the main lines, and transfer it to the promoters' South London Line, they were of opinion that the junction was not objectionable in an engineering point of view ; and that no danger would arise from crossing the local line in the manner proposed.

III.

Not Objectionable where the Signals will be under the control of the Line to be joined.

See *Glasgow and South Western Railway (Additional Powers) Bill*, 1866, 192, and other cases cited p. 120—1.

SECT. VIII.

JUNCTION IN A TUNNEL SANCTIONED.

In the *Barnet, Hendon, Hampstead, and London Railway Bill*, 1865, 69, the Metropolitan and St. John's Wood Railway objected to a proposed junction of Railway No. 2 with their line near the Swiss Cottage in a tunnel, and urged that this would interfere with the safe working of their line ; and they stated that Railway No. 2 was “on a gradient of 1 in 60 falling towards the point of junction in a tunnel for 18 chains,” and would effect the junction, “by a curve of 12 chains radius at a point where the petitioners' railway was on a gradient of 1 in 100, and on the wrong side of the permanently defined station, as regarded the use of signals, which would be arranged for the service of the Hampstead Junction Railway, which would come in at the other end of the station, and that this junction, as proposed by the promoters, must, therefore, endanger the safe working of the traffic” on the petitioners' line. They urged that the junction could not be lighted by any external light, as the proposed line was at a point under a public road ; and “that the Metropolitan Railway Company were actually going to a great expense to supersede one of their existing authorised junctions with the Great Northern

Railway, solely because the said junction was made in the dark." The promoters replied that such junction would be on a level part of the petitioners' line, the line of the promoters having 3 chains level at the junction point; that a junction in a tunnel was not, for practical working, more objectionable than many open-air junctions which were approached by curves and through cuttings and buildings, the position of which necessitated reliance on signals and not on the signalman's being able to see the approaching train; and that this part of the line could be efficiently worked by signals. The Referees reported, "on a careful consideration of the whole evidence, that there is no valid engineering objection."

SECT. IX.

JUNCTION OF PROPOSED NARROW GAUGE LINE WITH A BROAD GAUGE LINE AND *vice versa*.

Such junctions are frequently proposed, but of course can be entertained only where the laying down of an additional rail is contemplated, converting the narrow gauge line into a broad gauge line as well, or the broad gauge line into a narrow gauge line as well. Thus, in the *Ogmore Valley Railways* (No. 1) Bill, 1865, 420, the promoters having proposed to effect a junction with the Ely Valley Extension, it was objected that that line being broad gauge, a narrow gauge line could not join it. The promoters replied that the Ely Valley Company had the power and also the intention to lay down a third rail for narrow gauge; and the Referees reported that there were no engineering objections. And in the *Ely Valley and Vale of Neath Junction Railways Bill*, 1866, 90, a junction was proposed with an extension of the Ely Valley Line; but the proposed line being narrow gauge and the Ely Valley Line broad gauge, the Referees reported, "It is obviously impos-

sible to effect a physical junction between those lines, or to run through carriages over them. It was suggested that the mixed gauge was about to be laid down upon the Ely Valley Line; but no evidence was laid before the Referees to warrant them in coming to that conclusion. Upon these grounds, if this line be intended for through traffic, the Referees are of opinion that the engineering thereof is not efficient."

SECT. X.

BACK SHUNTS WHEN OBJECTIONABLE.

In the *Crofthead and Kilmarnock Extension Railway Bill*, 1865, 77, the Glasgow and South Western objected to a junction at Crofthead, as it would be effected at the north side of Neilston Station, 850 feet therefrom, the proposed line falling 1 in 70 into the Caledonian Railway, which is there upon a gradient of 1 in 66, falling from the station; and, to get to the station from Kilmarnock side, it would be necessary to make a back shunt up the incline of 1 in 66. The promoters replied that they intended to reduce the gradient of the proposed line, before coming to the junction, to 1 in 200, and place a new station upon the gradient so altered. The Referees reported that, "If this be effected, there can be no objection to the proposed junction." In the *London, Worcester, and South Wales Railway Bill*, 1865, 86, the Great Western objected that the promoters had no mode of getting into the existing Stratford-on-Avon Station, except by a back shunt over the authorised line of the East and West Junction Railway. The promoters undertook to erect a station near the junction with the East and West Junction Railway, so as to avoid the necessity of a back shunt. The Referees reported (in regard to this and other alleged objections), "subject to the foregoing remarks, the Referees are of opinion that

there are no engineering obstacles to the proposed railways." In the *Callander and Oban Railway Bill*, 1865, 176, it was intended to form a tramway from the terminus of the proposed line to the Oban Pier; which tramway was intended to cross the roads and streets on the level. The Referees reported,—"The tramway in question is an awkward way of effecting a communication between the proposed terminus and the pier, involving a back shunt, and being on gradients varying from 1 in 60 to 1 in 160 (where it crosses the main street); but it was stated that the object of passing, as it were, the town of Oban is to obtain a level space before arriving at the station, the railway approaching Oban being upon a descending gradient of 1 in 55; and that thereby a sufficient space will also be secured for a station. The Referees are of opinion that there are no engineering objections to the constructing the rail and tramways in manner proposed." In the *Perth General Railway Station, Scottish Central, &c., Railway Companies Bill*, 1865, 179, the Scottish Central Railway objected that Railway No. 2, which was intended to afford access to the intended new goods station from Line No. 1 from the south, would not effect any junction with the lines from the north. The Referees reported that, in that respect it would be defective in an engineering point of view, "as trains coming from the north will have to make a back shunt upon Line No. 1, which is intended to be the new main line." In the *Chipping Norton, Banbury, and East and West Junction Bill*, 1865, 195, it was objected that the junction proposed to be effected with the Great Western Railway at Chipping Norton would be at a distance of 52 chains from the station, the gradients of the proposed line being 1 in 63 up to 10 chains from the point of junction, and for that space 1 in 165 towards the junction, the gradient of the Great Western Railway being there 1 in 100 falling from the station. The Referees reported that "this will involve a back shunt of 52 chains up said incline of 1 in 100, for all trains passing from Banbury to Chipping Norton; and, in the opinion of the Referees, is an

engineering defect." In the *Ely and Ogmore Valleys Railway Bill*, 1865, 423, it was objected that, as the line was laid out, traffic going west from the Ely Valley Extension Railway would descend to the Gellyrhaid Branch, and then have to be shunted back up a gradient of 1 in 44. The promoters contended that the traffic requiring to be so shunted would be very small in amount. The Referees reported that the proposed junction would prejudicially affect a not unimportant traffic from the Ely Valley Extension Line, seeking a western destination ; and for this and other reasons they further reported that the proposed line was objectionable in an engineering point of view, and that the works were not efficient for the objects proposed. In the *Ogmore Valley Railway (No. 1) Bill*, 1866, 151, it was objected that, for traffic coming from the Llantrissart Branch and going to Cardiff, a back shunt would be required to bring it on to the Ogmore Valley system of Railways. It was, however, stated in reply that such traffic would not come on this line, but would pass over the Taff Vale system. It was further objected that the line would be carried by an expensive bridge under the Ely Valley Extension Line, so as to necessitate a back shunt up a steep gradient for intercommunication with that line, whereas it ought to have joined the said line on the level, and passed again out of it near the bridge. The Referees reported that "the works proposed by the promoters at this point are preferable to those suggested by the petitioners."

In the *Wolverhampton and North Staffordshire Junction Railway Bill*, 1 S. & G., 125, the London and North Western Railway objected that it was proposed to form a junction with the North Staffordshire Railway, at a point 30 chains past a certain station on that line, so that the traffic would have to be shunted back into the station. The Referees ruled that they could not entertain objections to this back shunting, as it was not a work sought to be authorised by the Bill, nor did it occur on any part of the proposed line, adding, "unless there is shunting on the proposed line, we have nothing to do with it."

SECT. XI.

WHEN OBJECTIONS TO JUNCTIONS MAY BE OBLIVIATED BY THE CONSTRUCTION OF BLIND SIDINGS.

In the *Crofthead and Kilmarnock Extension Railway Bill*, 1865, 77, the Glasgow and South Western Railway objected to a junction with their main line very close to the station of Kilmarnock, on the grounds that it would be necessary to cross upon a level certain lines of theirs leading to certain coal-pits, and that the effecting of such junction would interfere with their access to certain sidings on the west of their line. The Referees reported that the making of "the proposed junction would not be objectionable if made under proper arrangements, such as a blind siding to the coal pit line."

In the *Spalding and Bourn Railway Bill*, 1865, 286, it was proposed to cross the Bourn and Essendine Branch of the Great Northern upon the level, within about 10 chains of the Bourn Station, at the foot of a gradient of 1 in 100, descending towards the proposed crossing, and where the said line is in a cutting 5 feet deep, and has a curve of 20 chains radius. The proposed line would there have a gradient of 1 in 78, descending towards the said crossing. It was proved that the proposed line could not be carried under or over the existing railway ; and, in order to avoid any danger, it was proposed to construct a blind siding with self-acting points, which would turn any train coming from the Saxby side into such siding, instead of allowing it to cross the Bourn and Essendine Branch ; and that the control of the signals and points would be in the hands of the Great Northern Company. With these provisions, the Referees reported that there were no engineering objections. In the *Afon Valley Railway Bill*, 1865, 315, it was proposed, in order to obviate certain objections, to effect a junction with the Llynvi Valley Rail-

way, where the proposed railway would be upon a gradient of 1 in 40, descending towards the Llynvi Valley Line, which there is level for only 528 feet, and which has also, at that point, a branch line to the Maesteg Ironworks, diverging from that level space, which is barely sufficient for the traffic upon the line at that point. To obviate this objection the promoters proposed to put in a blind siding, with self-acting points, to divert all traffic descending the proposed line into it. The Referees reported that "the construction of this siding will be attended with considerable expense, as it will have to be effected by excavation into a bed of iron ore. But, if the Committee shall sanction the proposed alterations, there will not be any engineering objections to the construction of the proposed railways as intended to be altered." In the *Ely Valley and Vale of Neath Junction Railways Bill*, 1866, 90, it was objected that "where the junction is proposed to be made with the Ely Valley Line, the proposed line will be on a gradient of 1 in 40, and the Ely Vale Line is on a gradient of 1 in 42, both descending in the same direction." The Referees reported that this junction could not be effected with safety, except by means of a blind siding, which the promoters agreed to substitute.

SECT. XII.

FACING POINTS.

I.

Facing Points on Main Lines objectionable.

In the *Surrey and Sussex Junction Railway Bill*, 1865, 75, Line No. 1 was intended to commence by a junction with the main lines of the London, Brighton, and South Coast Railway at the east side thereof, close to Combe

Bridge, near Croydon, and would proceed on the eastern side of the said line through the shrubberies belonging to the house of A., and within about 40 yards of his residence. Line No. 2 would commence with the lines on the west of the London, Brighton, and South Coast Railway, which are intended for local traffic only, and, crossing the main lines by an over bridge, form a junction with Line No. 1 on the eastern side of the Brighton main line. Both these proposed railways were intended to be double lines. A. objected that Line No. 1 was injudiciously planned, and that other directions might be attended with less engineering defects. He proposed that part of Line No. 1 should be abandoned, as requiring the insertion of facing points on the Brighton Main Down Line; but in the event of its being retained he proposed certain variations. These, the Referees reported, would very much lessen the injury complained of by A., but would still leave the facing points in the Down Main Line; and "it having been given in evidence that the South Eastern Railway alone has thirteen trains daily each way, running at considerable speed over the place where the facing points are proposed to be put in," the Referees reported that "unless there be very strong reasons for effecting a junction with the main lines, that part of the proposed Railway No. 1 is defective in an engineering point of view, especially as the local traffic lines effect a communication with London." In the *Wood Green, Winchmore Hill, and Enfield Railway*, 1865, 108, the Great Eastern Railway complained that it was proposed to form a double junction with the Great Eastern Ordnance Station, with facing points on one of their main lines, and that the crossing of their line by the traffic of the proposed railway to the further side of the station, through which a large number of trains run daily at high speed, was inconvenient and dangerous. In reply, it was contended that the line by which the station was approached was entirely open to view; and that, if the traffic were worked in amity with the Great Eastern, as was intended, it would be so much under their control as to remove the objection. The

Referees reported, that "the introduction of facing points on the main line of the Great Eastern in the way proposed is very undesirable, and only to be allowed in case there are very strong reasons for effecting a junction with both the main lines at this station." In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, Railways Nos. 11 and 12, which were junctions with the North Eastern about 600 yards from the Alne and Tollerton Stations respectively, were objected to on the ground that facing points would be introduced into the North Eastern. The junctions would be effected with the up and down lines which were here, and for a long distance, upon the level; and on a part of the North Eastern upon which the express trains run at the highest speed, and the North Eastern had gone to much expense to avoid inserting facing points therein, there being but one set between York and Darlington. The promoters stated that the insertion of facing points could be avoided; "but not within the powers contained in the Bill, or without the concurrence of the North Eastern. The Referees reported that "the forming those junctions with facing points as proposed would be objectionable in an engineering point of view." In the *Mold and Denbigh Junction Railway (Extension) Bill*, 1865, 264, the Wrexham and Minera and Great Western Companies objected that the Line No. 1 proposed to cross the south fork of the petitioners' railway at Wrexham (there a single line) and to effect a junction with both lines of the Shrewsbury and Chester Railway at the south end of the Wrexham Station, taking no powers to use the station; and that the junction was proposed at a point where the Shrewsbury and Chester Railway was passing over a level crossing; that considerable and increasing mineral traffic was constantly, and at uncertain times, passing over the south fork over which the empty waggons are shunted, thus constituting it a siding as well as a main line for through trade; and that the introduction of two more lines at the level crossing is calculated to increase the danger and impede the safe working of the station. The promoters replied, in regard

to their taking no powers to use the station at Wrexham, that they would construct a station on their own land, and that the junctions generally were practicable, and not subject to any disadvantage other than those attaching to any junctions which require facing points to effect them. The Referees reported that "the junction at Wrexham (considering the nature of the traffic using the south fork of the Minera Line and the point at which, and the manner in which Line No. 1 proposes to join the main line of the Shrewsbury and Chester Railway) is very objectionable, and is a defect in an engineering point of view." In the *Llantrissart and Taff Vale Junction Railway Bill*, 1865, 422, Railway No. 1, on a gradient of 1 in 40, would join the Taff Vale Railway where the gradient was 1 in 290. It was objected that in order to effect a junction at this point, the gradient of 1 in 40 must be altered to 1 in 37, which would occasion an alteration in the level of 7 feet per mile, whereas 3 feet per mile is the utmost alteration allowed; and hence that no junction could be effected. The promoters stated, that inasmuch as no facing points were allowed on the Taff Vale Line, they proposed to join that line by a back shunt, which they alleged they had power to do by extending their line beyond the limits shown on the deposited plans, upon lands scheduled, the proposed works being works of convenience and not portions of the main line. And Railway No. 2, on a descending gradient of 1 in 50, would join the Ely Valley Railway where the gradient was 1 in 84; and it was objected that in consequence of the difference of the gradients, the proposed junction could not be effected without making a divergence beyond the limits shown on the deposited plans and sections. The promoters proposed to effect the junction in the same manner as the junction of Line No. 1 with the Taff Vale Line (in order to avoid facing points) which they alleged they had power to do. The Referees reported that, "It was proved to the Referees that the junctions, according to the deposited plans, could not be effected without facing points, which they considered would be objectionable in an engineering point of

view. The mode proposed by the promoters to obviate this difficulty cannot, in the opinion of the Referees, be effected under the powers of the Bill."

II.

Cases where Facing Points allowed, Speed of Trains being slow, or Junction being on the Level.

While facing points on steep gradients, and especially on main lines, are, as a rule, particularly dangerous and objectionable, it is to be borne in mind that the danger arising therefrom decreases in proportion as the speed of the trains, the steepness of the gradient, and the amount of the traffic, decrease. Thus, in certain cases, the Referees have sanctioned facing points on steep gradients, where they were satisfied that at the points of junction the speed of trains would be very slow, as at stations ; and in another case they reported favourably of facing points where these were on the level. The following are the cases referred to :—In the *Chichester and Midhurst Railway Bill*, 1865, 50, it was sought by Railway No. 1 to effect a junction at Haslemere with the direct Portsmouth Railway, at present constructed and used as a single line, and worked by the London and South Western Railway, who now alleged that the junction was at an inconvenient point, and would interfere with the working of the existing line at Haslemere. The Referees reported that, "although there are no engineering difficulties, the junction as proposed at 10 chains from the Haslemere Station will necessitate the insertion of facing points in a gradient of 1 in 100 falling from the station ; but as long as the line is worked as a single line, all trains stopping at Haslemere Station to pass, no down train would have acquired any considerable velocity before reaching the point of junction." And in the *Leeds, North*

Yorkshire, and Durham Railway Bill, 1855, 219, it was objected that Railway No. 5, terminating by a junction with the Leeds, Bradford, and Halifax Railway, would be dangerous; inasmuch as the latter line, at the point of junction, was upon a gradient of 1 in 50 descending towards the station; and that the introduction of facing points upon such a gradient would be attended with danger. The Referees reported that "the introducing facing points and forming a junction upon such a gradient is objectionable; but upon considering the character of the Leeds Station, and that the speed of trains must be slow at the point of junction, the junction in question may be sanctioned."

In the *Wrexham and Minera Railway Bill, 1865, 263*, the junction of Line No. 2 with the Fridd Branch was objected to, as being "at the foot of a gradient of 1 in 34, with facing points." It appeared that the junction would not be made at the foot of this gradient, but that, as shown on the plan, it would be more than 20 chains from that gradient, of which distance about 12 chains were practically level; the Referees reported that there were no engineering objections.

Facing point
on level
allowed.

III.

Two sets of Facing Points on a Single Line "highly objectionable."

In the *Swansea and Aberystwith Junction Railway Bill, 1865, 419*, the proposed line would form a junction with the Towy Vale Line three-quarters of a mile south of their Llandovery Station, at a point where the proposed deviation line of the Brecon and Llandovery Railway also joins it; and, as the main object of the proposed railway was to form a communication with the said devi-

ation line, this junction "would involve two sets of facing points on a single line," which the Referees reported would be "highly objectionable."

SECT. XII.

OBJECTION THAT, ACCORDING TO PLANS, NO PHYSICAL JUNCTION EFFECTED.

See Ch. ix. sect. 2.

CHAPTER VI.

STEEP GRADIENTS AND SHARP CURVES.—UNUSUAL DIFFICULTIES IN CONSTRUCTION.

SECT. I.

ENGINEERING RULES IN REGARD TO CURVES AND GRADIENTS.

“Although the determination of the curves and gradients CURVES. in any particular case must, in a great measure, depend upon the peculiar circumstances attending each case, there are, nevertheless, certain general rules which should always, if possible, be attended to. Those in regard to curves are, that sharp curves, where unavoidable, should be brought as near as possible to stations and other stopping places, and on no account on steep inclines, in order that the trains might not traverse the curve with any considerable velocity, since the tendency to leave the rails increases as the square of the speed of the train ; and curves should, if possible, be made on those portions of the line which are either on the surface or embanked, and not in deep cutting, where the curving of the railway would prevent a clear view of the line for any distance being obtained.” (*Law's Civil Engineering*, Part 2, p. 18.)

“As the perfect condition is a right line, so does comparative perfection consist in the minimum amount of deviation from it, that is, in the largest possible radius of curvature ; and in order to impose the least

diminution of speed, small curves should always be near to stations or stopping places ; and the more distant curves are from these the larger should be their radius." (*Dempsey's Practical Railway Engineer*, 4th Edition, p. 2.)

" The least objectionable situation for curves on a railway is at the extremities of the line (where they frequently occur of less than 500 yards radius) ; and at the foot of an inclined plane is the most dangerous, more particularly if any portion of it should be in tunnelling : the objection also increases with the speed of the train. (*Brees's Glossary, voce Curve.*)

Gradients.

" Steep inclines of greater length than one half to three quarters of a mile should not be introduced ; and if a summit level has to be surmounted, it is best to effect it by a succession of steep grades, with short level planes between them : the locomotives are thus enabled to recover their steam at certain intervals of the ascent, just the same as horses placed under similar circumstances recover their wind." (*Brees, voce Gradient.*)

" In long inclines it is desirable to form occasionally short benches or level portions, which, while they check the speed of a descending train, materially assist those ascending." (*Law's Civil Engineering*, Part 2, p. 18.)

Gradients at stations.

" A level plane, or, what is better, a short declivity, should always be introduced at starting from a *terminal* station, to facilitate the departure of the engine on one line and check the velocity of the approaching train on the other. *Intermediate* stations should not be situated on steep inclinations, on one side or the other ; for, as the trains approach in either direction, what would be gained on one side would be lost on the other : they should, therefore, be laid out on the level." (*Brees, voce Gradient.*)

TABLE OF GRADIENTS.

Ratio of inclination.	Per mile in feet.	Per chain in inches.	Ratio of inclination.	Per mile in feet.	Per chain in inches.
1 in			1 in		
5280	1	.15	170.3	31	4.65
2640	2	.30	165.0	32	4.80
1760	3	.45	160.0	33	4.95
1320	4	.60	155.3	34	5.10
1056	5	.75	150.8	35	5.25
880	6	.90	146.6	36	5.40
754.2	7	1.05	142.7	37	5.55
660.0	8	1.20	138.9	38	5.70
586.6	9	1.35	135.4	39	5.85
528.0	10	1.50	132.0	40	6.00
480.0	11	1.65	128.8	41	6.15
440.0	12	1.80	125.7	42	6.30
406.1	13	1.95	122.8	43	6.45
377.1	14	2.10	120.0	44	6.60
352.0	15	2.25	117.3	45	6.75
330.0	16	2.40	114.8	46	6.90
310.6	17	2.55	112.3	47	7.05
293.3	18	2.70	110.0	48	7.20
277.9	19	2.85	107.7	49	7.35
264.0	20	3.00	105.6	50	7.50
251.4	21	3.15	103.5	51	7.65
240.0	22	3.30	101.5	52	7.80
229.5	23	3.45	99.6	53	7.95
220.0	24	3.60	97.8	54	8.10
211.2	25	3.75	96.0	55	8.25
203.1	26	3.90	94.3	56	8.40
195.5	27	4.05	92.6	57	8.55
188.6	28	4.20	91.0	58	8.70
182.1	29	4.35	89.5	59	8.85
176.0	30	4.50	88.0	60	9.00

SECT. II.

OBJECTIONS TO STEEPNESS OF GRADIENTS AND SHARPNESS
OF CURVES.

In all the following instances (except the last—on p. 149) the Referees considered the proposed gradients and curves not objectionable in an engineering point of view, under the particular circumstances of each case. It will be observed from this and the two succeeding sections, in how small a proportion of cases such objections have been successfully taken.

In the *Metropolitan and St. John's Wood Railway Bill*, 1865, 109, a line was proposed from the Belsize Station of the authorised Metropolitan and St. John's Wood Railway to Hampstead. The proposed line would be $83\frac{1}{2}$ chains in length, of which $23\frac{1}{2}$ chains were horizontal, and $61\frac{1}{2}$ on a gradient of 1 in 27, and of which a length of 18 chains was in tunnel. The difference of height to be surmounted between Belsize and Hampstead stations was 148 feet. The Referees reported, “The proposed line, which leaves the Belsize Station on a curve of 10 chains radius, followed by a piece of straight for a little less than 1 chain, runs into a curve of 12 chains radius, and then proceeds to a piece of gradient of 1 in 250, on which a station is proposed to be constructed, and thence through a tunnel to Hampstead, entering the station by a curve of 15 chains radius. The long prevailing gradient of 1 in 27 was proved to be in considerable excess of that on any existing railway, except that leading to Oldham, over which a considerable goods and passenger traffic is conducted; but this line presented a most unusual combination of curves and gradients, particularly at the Belsize Junction, where the piece of inserted straight line (though capable of a small extension) is of the most limited length,

and barely sufficient to remedy the engineering objection of reversed curves of 10 and 12 chains radii. The Referees are of opinion (after hearing the evidence of the promoters as to the manner in which they propose and undertake to conduct the traffic over the line) that, if the break-power be sufficient, the trains very short, the line for passenger traffic only, worked by the best system of signals, under the conduct, on all occasions, of a pilot man, and by rolling stock specially constructed for the purpose, there are no insurmountable engineering objections to the construction of this railway." In the *Burton-upon-Trent and Nottingham Railway Bill*, 1865, 217, it appeared that Railway No. 1 would be led over a summit level 102 feet above its commencement at Burton-upon-Trent, and 172 feet above its termination at Nottingham. "At a little more than 8 miles from Burton it has a gradient of 1 in 100 for above 1 mile, then at $10\frac{1}{2}$ miles from Burton it has a gradient of 1 in 104 for $\frac{3}{4}$ of a mile, then 1 in 186 for $\frac{3}{4}$ of a mile, then level for 30 chains, then a gradient of 1 in 176 for 1 mile, then level, then a gradient of 1 in 102 for 2 miles 48 chains, then level, then 1 in 113 for 22 chains, then 1 in 693 into valley, and at 25 miles from Burton-on-Trent another gradient of 1 in 168." The Referees reported that "some of these gradients are steeper than may be desirable, yet that they did not constitute an engineering obstacle to the construction of the line or to the efficiency thereof;" and also that "the sharpest curve upon any of the proposed railways has a radius of 10 chains; and, as they all occur at or near junctions near to stations, the Referees are of opinion that there are not any engineering objections thereto." In the *Midland Railway (New Lines, &c.) Bill*, 1865, 223, the Midland Railway sought to acquire a certain existing railway, and to substitute it for a railway which they had been authorised to construct in the same parish under an Act obtained by them in 1863, but the construction of which it was now proposed to abandon. It was objected that "the line proposed to be substituted has curves and gradients which render it unfit for the con-

veyance of passengers." It was a short locomotive mineral line, unsanctioned by Parliament. The maximum gradient upon it was 1 in 78, and there was one curve upon it of 10 chains, which it was stated might be improved. The Referees reported that the line might be made so as to be fit for passenger and goods traffic, and that there was no engineering objection to it. In the *London and North Western Railway (New Works, &c.) [England and Scotland] Bill*, 1865, 242, a line of about 5 miles was opposed by owners &c., along the same, who complained of the steepness of the gradient and the heaviness of the works. The line would descend for 2 miles 5 chains by a gradient of 1 in 80, and, after a level of 100 yards, enter the St. Helen's Railway, which is also on the level. The promoters replied that from the nature of the country they could not avoid the gradient of 1 in 80; and that it would be a perfectly good gradient for the traffic likely to pass over the line. The Referees reported that the line might safely be constructed in the way proposed by the promoters, and that there were no engineering objections. In the *Lancashire Union Railway Bill*, 1865, 276, the gradients having been objected to, the Referees reported that "the steepest gradient is 1 in 90; and as steep gradients exist upon the several lines with which the proposed railway forms junctions at either end, the Referees are of opinion that the proposed gradient is not objectionable." In the *Isle of Wight Railway Bill*, 1865, 493, owners &c. along the line having objected that the line was badly laid out, the Referees reported that the worst gradient was 1 in 70; and that there was no engineering objection. In the *Kingsbridge Railway Bill*, 1866, 123, the Referees reported that the sharpest curve on this line of 2 miles 1 furlong was 14 chains, and the steepest gradient 1 in 54; and that there were no engineering objections.

Objections
obviated
within limits
of deviation.

In the *North of England Union Railway Bill*, 1865, 235, upon Railway No. 2, there were a number of reversed curves of 20 chains radius, with little or no straight spaces intervening between them, upon a gradient of 1 in 70.

The Referees reported that "Such curves are highly objectionable, but it was proved that, within the limits of deviation, they can be much improved ; and the Referees are of opinion that there are no engineering obstacles to this line being constructed as proposed."

Where a general objection is stated to the gradients of a proposed line, the promoters will find it a convenient course to prepare a table (to be handed in to the Referees) showing all the various gradients on the line, and the lengths of each. This course has been adopted in several cases, as in the *South Lancashire Railways, &c. Bill*, 1865, 273 ; the *Lancashire Union &c. Bill*, 1865, 276 ; the *East and West Yorkshire &c. Bill*, 1865, 237 ; and the *North of England Union &c. Bill*, 1865, 235.

In the following instance, the Referees reported against the proposed gradients. In the *Wrexham, Mold, and Connah's Quay Railway Bill*, 1865, 260, Line No 6. would descend by a gradient of 1 in 25 for 8 chains, continued by a gradient of 1 in 50. The Referees reported that "the gradients would be highly objectionable for ascending traffic ;" and recommended the abandonment of that line as objectionable in an engineering point of view. And in the *Same Bill*, Railway No. 7, which descended for upwards of 3 furlongs, by a gradient of 1 in 18·63, was objected to as being highly dangerous. The promoters replied that "there was a choice of difficulties, and that the line was proposed with the view of getting rid of the evil of a double shunt over two level crossings ;" but it was not denied that this line was of little use, that it was only intended for return waggons, and that it was unsuited for heavy traffic. The Referees reported that the line, in an engineering point of view, was objectionable ; and they recommended its abandonment.

1 in 25 for
8 chains
continued by
1 in 50
objectionable.

1 in 18 for
3 furlongs
objectionable.

SECT. III.

LINES OF EXTRAORDINARY DIFFICULTY IN CONSTRUCTION—
DIFFICULT COUNTRY, ETC.

The Referees are always willing to recognise the fact that the country through which the proposed line would pass presents extraordinary and unusual difficulties in the way of the engineer; or that any difficulties out of the ordinary category have had to be overcome in the laying out of the line. In addition to some of the cases cited in the preceding section, the following deserve special attention with reference to this subject. In the *Chichester and Midhurst Railway Bill*, 1865, 80, the London, Brighton, and South Coast Railway objected that the works of Railway No. 1 from Midhurst to Haslemere were "heavy and costly." The Referees were of opinion "that the long gradient of 1 in 70, a tunnel 1,089 yards in length, as well as some curves which will require great care in the working of the railway, are necessitated by the features of the country through which the railway is proposed to be driven, a difference of 332 feet in height having to be surmounted between the terminal points, and having to be effected in the last three miles of the north end of the railway." In the *London, Brighton, and South Coast Railway (St. Leonards Line and Deviations) Bill*, 1865, 57, the line as proposed would pass for upwards of 4 miles through two of the levels under the care of the Commissioners of Sewers, &c., for the levels within the Rapes of Pevensey and Hastings, crossing divers sewers, streams, ditches, and watercourses. The Commissioners alleged that the ground was so moory and unsound that it would be impossible to construct embankments of the necessary height, without occasioning great bulging of the soil on either side. They gave the result of borings made along the line of the proposed rail-

way, showing the ground to be in great part boggy and unsound, and maintained that, owing to the weakness necessarily incident to embankments of a height varying from 16 to 32 feet, constructed upon such soil, openings for the passage of cattle, the flow of water, and other purposes, could not be made in them ; and that the drainage of the levels, which was already too slow, would thus be further materially obstructed. They further maintained that eight culverts of certain dimensions (which they specified and which are also specified in the Referees' report) would be necessary. The promoters' engineer did not dispute the correctness of the borings, but "unhesitatingly declared that he apprehended no particular difficulty in the proposed work, whether from the nature of the soil or other circumstances alleged ;" and the company agreed to make all necessary openings in the embankments and all the culverts, except two which they considered unnecessary. The Referees reported, that there were "no engineering difficulties which are not of a character well understood and readily to be surmounted by the means ordinarily resorted to in similar circumstances ;" and that the provisions for carrying off the water which the promoters agreed to make would suffice for that purpose. In the *Glasgow City Union Railway Bill*, 1865, 105, the Referees reported, "The objections which were urged embraced a great diversity of engineering points in respect to junctions, gradients, curves, interference with public streets, and similar matters involving considerations of public safety and convenience ;" and that "considering all the circumstances of the locality and of the existing railways, no valid objection was made out to the scheme of the Glasgow Union Railway ; but that, if sanctioned, it would fulfil the object of providing continuous communication between the several railways and stations proposed to be connected together, in a manner consistent with the convenient accommodation and (reasonable care and skill being assumed) the security of the public.' (a)

(a) See Caledonian (Glasgow South Side) Line, *infra*.

In the *Greenock Railway Bill*, 1865, 187, the line would ascend from Greenock for upwards of 3 miles on a gradient of 1 in 70, with one piece of gradient of 1 in 200 for 100 yards, and for a further distance of 2 miles at 1 in 100, with one piece of gradient of 1 in 200 for 100 yards ; and after passing the summit (355 feet in height) it would descend for about 5 miles at 1 in 100. There were three tunnels of the respective lengths of 693 yards, 320 yards, and 180 yards in the first 2 miles ; and there were in the same distance 4 curves of 15 chains radius, one of which is in the tunnel of 693 yards, and 2 of the curves were reversed curves. And it was further objected that the Line No. 2 would descend abruptly by a steep gradient of 1 in 40 to the harbour on to a level of only 160 feet. The promoters stated that the last-named objection would be met by the connection which the line would form with the proposed works in the harbour in the course of construction by the Corporation ; and they maintained that the engineering difficulties urged by the petitioners were inherent in an undertaking which carried a railway, by so steep an ascent, from the harbour to such an elevation ; and that the sharpness of the curves might, in some cases, be eased within the limits of deviation. The Referees reported that "the descending traffic to the harbour will require care in its management ; but there is no reason to doubt that through the line generally the traffic may be worked with efficiency on gradients of the steepness above stated, and the Referees consider they do not in themselves constitute a valid objection to the undertaking." In the *Central Wales and Staffordshire Junction Railway Bill*, 1865, 215, it was objected that Line No. 1 would descend with a gradient of 1 in 66 for a mile and a quarter to the Bridgnorth Station, where it would have a level space of $5\frac{1}{2}$ chains. The promoters proved that the nature of the country rendered it difficult to approach Bridgnorth with a good gradient. The Referees reported there were no engineering objections. In the *East and West Yorkshire Union Railway Bill*, 1865, 237, the promoters of the North of England Union Railway (a competing line also before

Parliament) alleged "that the engineering details of the proposed line were exceedingly defective, unsuitable, and inefficient. Evidence was given that the proposed line, after having attained a considerable level, descended for an amount of $95\frac{1}{2}$ feet, and again ascended to cross the summit level between Sedberg and Leyburn." The Referees' report contains a table showing the undulating character of the gradients. It was also objected that Hawes was the only place where a junction could be effected with a north and south line, and that the line at that place was at so low a level that it could not be connected with any such line. The Referees reported, "The promoters gave evidence that the worst gradient upon their line is 1 in 70 ; that the line is carried down into the valley at Hawes, in order to accommodate the population ; and that Hawes is not the proper place for a communication with the north and south line, being 640 feet below a summit that should be crossed by any line going south ; and that if any such north and south line should be made, it should cross the promoters' line far to the west of Hawes. The country over which it is proposed to carry this line is very difficult, and the Referees are of opinion that there are no engineering objections to the executing the works as proposed." In the *Midland Railway (Barnsley to Kirkburton) Bill*, 1865, 241, the Lancashire and Yorkshire Railway objected "that the works are costly ; that the line is ill-chosen, and involves engineering difficulties which might have been avoided." The line was $12\frac{1}{2}$ miles in length. It commenced at Barnsley on an embankment 52 feet high, and at $1\frac{1}{2}$ miles from Barnsley it was in a cutting 45 feet deep. At 2 miles there was an embankment 73 feet high ; and, after passing through a cutting 53 feet deep, there was an embankment and a viaduct 223 yards in length and 65 feet high, which crossed over the line of the Lancashire and Yorkshire Railway. At $4\frac{1}{4}$ miles from Barnsley there was an embankment 65 feet high, and a viaduct 365 yards in length, and 83 feet high at its highest point. At $5\frac{1}{4}$ miles there was a cutting 70 feet deep, and then a tunnel 1,294 yards in length,

with cuttings at each end of 64 and 65 feet ; and at 7 miles another embankment 62 and 65 feet high, and $\frac{1}{2}$ a mile long. At $8\frac{1}{2}$ miles there was another cutting 66 feet deep for $\frac{1}{2}$ a mile, and at 9 miles 3 furlongs a tunnel of 814 yards. At 10 miles there was a cutting of 54 feet, and then an embankment of 62 feet ; and at $11\frac{3}{4}$ miles there was a cutting of 60 feet and an embankment of 70 feet. The Referees reported that “these are very heavy and expensive works, but they are required to obtain good gradients, as the line passes through a difficult country ; and the estimate is not objected to. There is a gradient of 1 in 70 at the junction with the London and North Western Railway at Kirkburton ; but 1 in 100 is the worst gradient on the rest of the line ;” and that there were no engineering objections to the proposed railway. In the *Aboyne and Braemar Railway Bill*, 1865, 216, objections were taken to the close proximity of the line to a much frequented public road, passing up a narrow valley by the side of the River Dee ; but the promoters answered that, in a narrow valley already traversed by a road and a river, it was not possible to carry the line otherwise than as proposed, and that by putting a screen in certain places by the side of the road, and in others by the side of the railway, the view of the trains might be effectually prevented ; and the Referees reported that “On the question whether the line can be worked as laid down without possible danger to the public using the road in such close proximity both to the railway and the river, the Referees pronounce no opinion ; but it was proved to their satisfaction that screens, as proposed by the promoters, could be erected ; and they have further to report that there are no engineering objections to the construction of the proposed line.” And in the *Lancashire and Yorkshire Railway (Additional Powers) Bill*, 1865, 239, it was objected that, at the termination of a curve of 12 chains in a deep cutting of 43 feet (in some parts), the railway would come upon a turnpike road, and run parallel with it on a slightly higher level for about 60 chains, at a distance of only 30 yards ; but the promoters replied “that

the valley was only 60 yards wide, and that the proximity to the road could not be avoided." The Referees reported that the line could not well be carried in any other way than that proposed, but that they considered that a screen should be erected and kept up by the Railway Company (if requested to do so) between the turnpike road and the railway; and that there were no engineering obstacles. See also *Vale of Crickhowell Railway (Western Extension) Bill*, 1865, 368, cited p. 117.

It will be observed that in all of the foregoing instances the Referees reported in favour of the proposed line. In the *Caledonian Railway (Glasgow South Side Railways, &c.) Bill*, 1865, 106, however, which was a rival scheme to the *Glasgow (City) Union Railway Bill*, 1865, 105, *supra*, the Referees reported adversely—that "a great quantity of evidence, the principal part of which was of a highly technical character, was laid before the Referees by the opponents, designed to show that, whatever might be the recommendations of the scheme from the Caledonian Company's point of view, the continuous communication which it offers would be subject to serious disadvantages in regard to the interests of the public, especially to delays and impediments arising from the complication of the intersecting and connecting lines, and the accumulated traffic liable to be thrown upon some parts of the communication already much burthened with traffic of their own. As an instance of this it was pointed out that a portion of the Clydesdale Junction Railway, which, according to the proposed scheme, would form an integral part of the continuous communication, is at the present time the channel of a heavy mineral traffic—no less than 106 trains in 24 hours passing along that line, of which 3 only are passenger trains. The alleged danger and difficulty in the working of a large and constantly flowing stream of passenger traffic along a line so circumstanced might no doubt be mitigated by additional vigilance and care, but only, according to the admission of the promoters themselves, at the expense of time; and delay is itself a consideration of serious importance in regard

to a passenger traffic of such nature and amount as the proposed lines would be required to accommodate. After carefully weighing all the facts laid before them, the Referees are of opinion that the scheme, though highly complicated, had been very ingeniously devised; but they considered that the works would not be so efficient for the object proposed, as in the interest of the public should be required."

SECT. IV.

STATION ON OR NEAR TO STEEP GRADIENTS.

In the *London, Worcester, and South Wales Railway Bill*, 1865, 86, the Great Western Railway objected that, at Worcester, the proposed line would descend from a junction with their line near Forgate Station, with a gradient of 1 in 44, and then run horizontally for only 10 chains to a terminus on the level of Sansum Street, in Worcester. The Referees reported that the "gradient of 1 in 44 to within 10 chains of a terminus on the level of a street is of an unfavourable character." In the *Okehampton Railway Bill*, 1865, 92, the Referees reported, in regard to Railway No. 7, "This railway descends towards the south with a gradient of 1 in 60; it then crosses upon the level the main street leading into Plymouth from the east; and, shortly after, descends with a gradient of 1 in 40 to within 3 chains of its termination near the waterside. The Referees are of opinion that this gradient, so near the terminus, is very objectionable in an engineering point of view." In the *Crystal Palace New Railways Bill*, 1865, 159, the London, Brighton, and South Coast Railway objected that Railway No. 1 would be on a gradient of 1 in 70 from its point of junction with the Crystal Palace and South London Junction Railway for a distance of $2\frac{1}{4}$ miles, and that it was proposed to place a station upon the said line at a

point within that distance ; but, the promoters having satisfied the Referees that they could construct a part of the said line, for the distance of 150 yards, with a gradient of 1 in 300, the Referees reported that that would suffice for the placing of such station. In the *North British Railway (Lasswade, &c., Branches) Bill*, 1865, 174, on the petition of the Caledonian Railway, the Referees reported that the gradients upon the proposed lines were of an inferior character, being, for a considerable portion of the lines, 1 in 50 ; but that this gradient was not continuous, having several level, or nearly level, portions at intervals where it is proposed to place stations ; and that better gradients could have been obtained by taking a more direct line, and that the promoters had stated that they were induced to take the line proposed in order to meet the wants of the population. In the *Greenock Railway Bill*, 1865, 187, Line No. 2 descended abruptly by a steep gradient of 1 in 40 to the harbour on to a level of only 160 feet ; but the promoters contended that this objection would be met by the connection which the line formed with the proposed works in the harbour in the course of construction by the Corporation. The Referees reported that "the descending traffic to the harbour will require care in its management." In the *Central Wales and Staffordshire Railway Bill*, 1865, 215, the Great Western Railway objected that Railway No. 1 would descend with a gradient of 1 in 66 for a mile and a quarter to the Bridgnorth Station, where it has a level space of $5\frac{1}{2}$ chains ; and that it did not form any junction with the Great Western Railway, but ran parallel to it at a distance of about 1 chain. In reply, it was proved that the nature of the country rendered it difficult to approach Bridgnorth with a good gradient ; and that this gradient was made so steep, mainly for the purpose of keeping the rails of the proposed line in Bridgnorth Station at the same level as the rails of the Great Western Railway there, so that a connection might be effected at any time hereafter. The Referees reported that there were no engineering objections. In

the *Lancashire and Yorkshire Railway (West Riding Branches) Bill*, 1866, 161, it was objected that the goods station at Huddersfield would be placed upon a gradient of 1 in 154 at the foot of an incline of 1 in 70. The Referees reported that, "under all the circumstances, this arrangement is not defective in an engineering point of view." And in the *Bo'ness, Grangemouth, and South Alloa Junction Railway Bill*, 1866, 264, it having been objected that at Bo'ness the gradient of the line would be 1 in 73 at the point indicated by the promoters as the intended site of the station, the promoters replied "that the station was not positively decided upon ; but that, when it is, the gradient of the line could, without difficulty, be flattened ;" and the Referees reported the works efficient.

SECT. V.

OBJECTION THAT LINE WILL BE BELOW LEVEL OF ADJACENT RIVER, CANAL, ETC.

The danger arising from inundation of the line from this cause has, on several occasions, been made a ground of objection. In the *Aboyne and Braemar Railway Bill*, 1865, 216, it was objected that near Aboyne the line crossed the Tullich Burn, a wild mountain stream very formidable in winter, that the line was 11 feet below the level of the burn and in cutting, and that the stream could not be carried either under or over the line except at very great expense. The promoters, however, proved that the burn could be lowered and carried under the railway for £500. And in the *North Kent Railway Bill*, 1865, 511, the petitioners stated that the line (which would run from the existing North Kent Line to the Medway, opposite Sheerness) was at too low a level, the rails being in most parts on the level of the Trinity high-water mark at spring

tides in the River Thames, from which the district through which it is carried is protected by an embankment; and that it ought to be laid from 4 to 5 feet higher, to prevent its being injured by inundation, if this embankment were broken by accident or otherwise. It was proved that the embankment of the Thames there had been in existence for a long series of years; and that there was not the slightest ground for anticipating any accident of the kind suggested. The Referees reported that there was no engineering objection. See also the *Brecon and Merthyr Tydfil Junction Railway Bill*, 1865, 425, (cited *ante*, p. 88) where the proposed line would run for five miles beside the Glamorganshire Canal, and for two miles of that distance below the level of the canal.

SECT. VI.

GRADIENTS AT LEVEL CROSSINGS OVER ROADS AND STREETS.

On this subject see Chap. VII., sects. 2 and 3.

CHAPTER VII.

INTERFERENCE WITH ROADS AND STREETS.—BRIDGES UNDER AND OVER SAME.—ALTERATION OF INCLINATIONS, ETC.

SECT. I.

CROSSING ROADS AND STREETS ON THE LEVEL.

I.

Provisions of the General Acts on this subject.

By 5 & 6 Vict. c. 55, (a) it is provided, sect. 9, that a railway company shall be bound to erect gates and employ a gatekeeper at every level crossing; (b) and by sect. 13, where level crossings exist over "private roads, highways, and private roads and tramways," the Board of Trade are empowered to authorise the company to carry such roads, &c., over or under the railway. (c)

By the Railways Clauses Act, 1845, (d) sect. 46, it is provided that, "If the line of the railway crosses any turnpike road or public highway, then (except where otherwise provided by the special act) either such road shall be car-

Railway not
to cross roads
on level,
unless other-
wise provided
by special
Act.

(a) This Act extends to Scotland.

(b) See Railway Clauses Act, 1863, sect. 6, where the company are required to erect a lodge at each level crossing.

(c) See Railway Clauses Act, 1863, sect. 7, by which the Board of Trade may require the company to do this, where necessary for the public safety.

(d) See similar provisions in Railways Clauses (Scotland) Act, 1845, sect. 39, *et seq.*

ried over the railway, or the railway shall be carried over such road, by means of a bridge of the height and width, and with the ascent or descent by this or the special act in that behalf provided ; and such bridge, with the immediate approaches, and all other necessary works connected therewith, shall be executed, and at all times thereafter maintained, at the expense of the company ; provided always, that, with the consent of two or more justices in petty sessions, as after mentioned, it shall be lawful for the company to carry the railway across any highway, other than a public carriage road, on the level." By sect. 47, it is provided that, if a railway cross public roads on a level, the company shall erect gates and keep the same closed across such roads ; but the Board of Trade may order that such gates be kept closed across the railway instead of across the roads. By sect. 48 it is provided, "Where the railway crosses any turnpike road, on a level, adjoining to a station, all trains on the railway shall be made to slacken their speed before arriving at such turnpike road, and shall not cross the same at any greater rate of speed than 4 miles an hour ; and the Company shall be subject to such rules and regulations, with regard to such crossings, as may from time to time be made by the Board of Trade." And by sect. 61 it is provided that, "If the railway shall cross any highway other than a public carriage way on the level, the company shall at their own expense make, and at all times maintain, convenient ascents and descents, and other convenient approaches, with handrails or other fences, and shall, if such highway be a bridleway, erect and at all times maintain good and sufficient gates, and if the same shall be a footway, good and sufficient gates or stiles, on each side of the railway where the highway shall communicate therewith."

By sect. 53 it is enacted, that, before interfering with roads, &c., so as to render the same dangerous or impassable, the Company shall provide other roads.

The 26 & 27 Vict., c. 92, also contains certain enactments on this subject :—By sect. 5 it is provided that

But proviso
as to high-
ways.

Gates to be
erected by
company.

Trains not to
cross roads
adjoining
stations at
more than
four miles an
hour.

Company to
make ap-
proaches and
fences, &c., to
bridleways
and footways
crossed on the
level.

Bridleway.

Footway.

*Trains not to
be shunted over
level crossings.*

“Where the company is authorised by the special act to carry the railway across a turnpike road or public carriage road on the level, it shall not be lawful for the company in shunting trains to pass any train over the level crossing or at any time to allow any train, engine, carriage, or truck to stand across the same.” Sect. 6 provides that the company shall erect a lodge at the point of crossing. Sect. 7 empowers the Board of Trade to *require* the erection of a bridge, instead of a level crossing, where that appears to them necessary for the public safety.

Company to
erect *lodge* at
point of
crossing.
Board of
Trade may
require bridge
instead of
level crossing.

Must be
specially
authorised.

Level
crossings close
to one already
existing
allowed.

Level crossing
over road not
used with
wheels.

II.

Crossing Roads on the Level.

It has been seen that no level crossing over roads can be effected unless specially authorised by the promoters’ Act. (*Railway Clauses Act*, 1845, sect. 48.) Accordingly, where in the *Bedford, Northampton, and Weedon Railway Bill*, 1865, 67, the petitioners proposed a certain deviation of the line, the Referees reported, “But this deviation would involve the crossing of a road upon the level, for which no provision had been made in the Bill.” In the *Bo’ness, Grangemouth, and South Alloa Junction Railway Bill*, 1866, 264, it was objected that the proposed line would make a second level crossing over the Grangemouth and Bo’ness Turnpike Road, in addition to one already existing. The promoters replied, “that the level crossing would be close to the one now existing, and would in no way add to the inconvenience.” The Referees reported that the works were efficient. In the *Wrexham and Minera Railway Bill*, 1865, 263, it was objected that the line crossed on the level a public road, the gradient of which was 1 in 5. The promoters replied that this road was scarcely ever used with wheels; and that, therefore, no real danger would

arise. The Referees reported that there were no engineering objections. In the *North British Railway (Additional Powers) Bill*, 1865, 178, the Bill would enable the promoters to carry their railway with a double line of rails across a certain road, which was already crossed by them with a single line of rails. The Road Trustees objected to the laying of a second line of rails, as "dangerous and tedious;" and they gave evidence that the said road could be carried over the railway without increasing the gradient of the road, now 1 in 9½. To carry the road over the railway in the manner proposed, would necessitate an embankment above 15 feet high, with proportionate slopes at the sides; and the approach on the south side would run out above 150 feet. The Referees reported, "There are no engineering obstacles to laying the second line of rails, or to constructing the proposed bridge; but the Referees do not consider that it lies within their province to offer an opinion as to the propriety of carrying the said road over the railway by the proposed bridge." In the *Wrexham, Mold, and Connah's Quay Railway Bill*, 1865, 260, on Railway No. 2 a road was intended to be raised 6 feet 6 inches, and then crossed on the level; and on Railway No. 3 a similar level crossing was proposed. It was admitted by the promoters that these crossings might be obviated by the construction of bridges; but it was said with regard to the first that there was very little traffic on the road; and with regard to the second, that a bridge would be very expensive, and that no serious damage need be apprehended, as the road is at this point level, and the railway is on a gradient of only 1 in 330. The Referees reported, "The Referees offer no opinion on the expediency of constructing bridges in these several cases. The inconvenience that would arise from the level crossings complained of was not proved to them to be of such a nature as to constitute an engineering objection to the lines on which they occur."

It is the not unfrequent recourse of Road Trustees opposing, to suggest, before the Referees, the construction of a bridge instead of a level crossing over their road. The

Additional
line of rails
over road
allowed.

Over road
with little
traffic.

Where bridge
proposed by
petitioners
instead of
level crossing.

two last-mentioned cases illustrate the manner in which the Referees deal with such suggested alterations. In the one case, they "do not consider that it lies within their province to offer an opinion as to the propriety of carrying the said road over the railway by the proposed bridge;" and in the other, they "offer no opinion on the expediency of constructing bridges"—although in the first case the petitioners alleged that the road could be carried over the line without increasing the gradient of the road. See *Midland Railway (Ashby and Nuneaton, &c.) Bill*, 1866, 117, *infra*, p. 168; and *Midland Railway (New Lines, &c.) Bill*, 1865, 223, cited *infra*, p. 166.

Where diversion of a road proposed.

Where the diversion of a road, capable of being effected within the limits of deviation, has been proposed before the Referees, they have considered that to be within their province. Thus, in the *Havant, Hambleton, and Droxford Railway Bill*, 1865, 45, where it was proposed by the promoters to divert a turnpike road, the Referees reported, "This diversion can be made within the limits of deviation." And the opponents (the Petersfield and Bishops Waltham Railway) having objected that this diversion would interfere with a certain bridge which they were about to construct, the promoters agreed "to divert the turnpike road without any interference with the petitioners' bridge." And in the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, where it was objected that the centre of the Railway, as laid down, touches the west side of the Leeds and Collingham Road, and that the slope of the cutting would extend across the same, the promoters replied "that the limits of deviation would allow the direction of either the railway or the road to be so altered as to avoid any interference;" and the Referees reported that no engineering objection existed. And in the *London, Brighton, and South Coast Railway (Various Powers) Bill*, 1866, 255, where the petitioners objected to the level crossing (over a road) near to the junction of the proposed railway with the promoters' Shoreham, &c. Branch, "inasmuch as the long and narrow approach to it on the one side, and the prox-

Objection to a level crossing obviated by improving approaches, inclination, &c.

mity of another level crossing over the same road by the latter line on the other, would render it dangerous, and increase the objection on the same account to the existing level crossing ;" and the promoters stated in reply, that they proposed to widen the approaches, and alter the inclination of the roadway from a gradient of 1 in 30 falling towards the level crossings to the level, and that these works would so improve the approaches as to remove the petitioners' objections ; the Referees reported that, " subject to these alterations, the works in an engineering point of view were efficient."

In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219 (by which 21 railways were proposed to be constructed in the West and North Ridings of Yorkshire, and in the county of Durham) the North Eastern Railway complained generally "that the proposed railways will cross 73 public roads on the level." Two bodies of Road Trustees opposed ; but their objections were confined to five specified level crossings. The Referees' report (so far as appears from it) was not influenced by the above general objection, upon which no detailed evidence appears to have been given.

Seventy-three
level crossings
proposed.

III.

Crossing Streets on the Level.

Streets, like roads, cannot be crossed on the level, unless special authority be obtained (Railways Clauses Act, 1845, sect. 48). Thus, in the *Bedford, Northampton, and Weedon Railway Bill*, 1865, 68, where, by the deposited plans, it was proposed that the railway should cross a certain street called Cow Lane, in Northampton, at 2 feet below the existing level of the said street, the Referees reported, " But no provision is made in the Bill for crossing this street upon a level ; and to take the same under or over the

proposed railway, would require the approaches to be made steeper than the gradient of the present road (1 in 16), for which no powers are taken in the Bill. In answer to this objection, it was stated that an agreement had been made with the surveyor of the Town Commissioners of Northampton, to divert Cow Lane, and take it under the proposed railway, with a maximum gradient of 1 in 13. Without some such arrangement the railway cannot be constructed ; and, as the Referees have no power to deal with the same, they must report that, as the Bill stands, the proposed railway cannot be constructed ; but if such agreement can be carried out, there will not be any engineering impediment thereto."

In the *Callander and Oban Railway Bill*, 1865, 176, it was objected that the proposed railway would not be connected directly with the pier at Oban, and that it was intended to form a tramway from the terminus of the proposed line to the pier, which tramway would cross the roads and streets on the level, and would interrupt the traffic of the streets. The Referees reported that the tramway in question was an awkward way of effecting a communication between the proposed terminus and the pier, involving a back shunt, and being on gradients varying from 1 in 60 to 1 in 160 (where it crosses the main street) ; but it was stated that the object of passing, as it were, the town of Oban was to obtain a level space before arriving at the station, the railway approaching Oban being upon a descending gradient of 1 in 55, and that thereby a sufficient space would also be secured for a station. The Referees reported that there were no engineering objections to constructing the rail and tramways in the manner proposed.

In the *Midland Railway (New Lines, &c.) Bill*, 1865, 223, the Local Board of Health of Ashby-de-la-Zouch complained that the railway would cross on the level certain of the streets and roads under their control, which would be highly dangerous in consequence of the steepness of the gradients. It appeared that the promoters proposed to take, for the purposes of the line, an ex-

Crossing
streets of
Oban on level.

Crossing
streets of
Ashby-de-la-
Zouch on
level.

isting horse tramway, which crossed on the level the streets now proposed to be crossed in the same manner. One of these was the principal street in the town. "The ascending gradients from the railway upon it are, for 53 yards, 1 in 41, then for 90 yards 1 in 23, and for 23 yards 1 in 53." The Referees reported that "this is a very steep descent to a level; but the promoters maintained that it was impossible to throw a bridge across it, because the necessary embankments would destroy the houses which are on the sides of the street at the crossing. This is an engineering objection to the proposed line; but the Referees are of opinion, that, if protected by gates and a watchman, the crossing will not be more dangerous than it is at present over an open tramway without such precaution." Another of the streets which would be crossed had a descending gradient towards the railway of 1 in $16\frac{1}{2}$ for 250 yards. The petitioners stated that they were improving it, to provide for traffic on it. The promoters admitted that a bridge might be thrown over this crossing, but stated it was unnecessary, there being so little traffic, as it was only a private or bridle road. The Referees reported that there was no engineering objection. In the *London and South Western Railway (Additional Powers) Bill*, 1866, 178, the Wandsworth District Board of Works, and others, objected that, by the increased power of laying fresh rails across a lane adjoining the goods station at Nine Elms, increased annoyance would be caused to the passengers and goods traffic proceeding along the line; and that, by a diversion of the lane and widening it at a certain point, this inconvenience might be obviated, and consequently that the engineering is bad. The lane was already crossed by two sets of crossings 500 feet apart; and the proposed new crossing would be intermediate between them. Inasmuch as a large amount of traffic was then and must still be worked across the lane, the promoters agreed to widen the lane 40 feet; and the Referees reported that "there is no objection, as a mere question of engineering, to the proposed alteration."

Crossing lane
at Nine Elms.

Two sets of
crossings
existing.

IV.

Level Crossings over Roads and Streets allowed where near Stations.

The reason of this is obvious. The speed of trains must there necessarily be slow under ordinary circumstances; and, besides, by the 48th section of the Railways Clauses Act, 1845, the speed of trains over such crossings shall not exceed four miles an hour. In the *Midland Railway (Ashby and Nuneaton, &c.) Bill*, 1866, 117, it was objected that the line would cross a public road on the level, "where the gradient of the road was so steep as to render the crossing dangerous;" and that this might be obviated by carrying the railway over the road, which could have been done by altering the gradients from 1 in 390 and 1 in 660, to 1 in 200. The promoters proved that, for a considerable distance from the crossing, the gradient of the road would not be less than 1 in 63, and they stated that they intended to erect a station at this point; and that, to carry the railway over the road, an embankment of 32 feet in height would be required, which would make it impossible to erect a station, with proper sidings and other requirements, in such a manner as to secure the convenience of the public. The Referees reported that there were no engineering objections. In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, the Leeds and Collingham Road Trustees complained that Railway No. 1 would cross their turnpike road "upon the level where the railway is on a curve, and the road upon a gradient of 1 in 20." The promoters explained, that "most probably there would be a station near to this level crossing; and the Referees did not consider the same objectionable." In the *Same Bill*, the Tadcaster and Otley Road Trustees complained Railway No. 2 would cross their road close to Collingham upon the level, and also that 30

chains the railway would run nearly parallel to the said road. "It was proved that the road could not be carried under the railway, because it would then be below the level of the adjacent river, which would prevent it from being drained ; and that, if the road were carried over the railway, in order to give the necessary gradient to the approaches of the bridge, they should be carried across other roads and into the adjacent village ; and, further, that most probably a station would be placed close to the road." The Referees reported that "there is no engineering objection to the said level crossing ; but that a screen should be erected along said road, if required."

SECT. II.

ALTERING INCLINATIONS OF ROADS AND STREETS.

I.

Provisions of the General Act.

The Railways Clauses Consolidation Act, 1845, (*a*) in regard to the altering the inclination of roads in order to carry the same under a railway, provides by the 49th section that :—

"The descent made in the road in order to carry the same under the bridge shall not be more than 1 foot in 30 feet if the bridge be over a turnpike road, 1 foot in 20 feet if over a public carriage road, and 1 foot in 16 feet if over a private carriage road, not being a tramway or railroad, or if the same be a tramway or railroad, the descent shall not be greater than the prescribed rate of inclination ; and if no rate be prescribed, the same shall not be greater than as it existed at the passing of the special Act."

(*a*) See Railways Clauses (Scotland) Act, sect. 42, *et seq.*

And, in reference to the ascent of roads passing over railways, the 50th section provides :—

“ The ascent shall not be more than 1 foot in 30 feet if the road be a turnpike road, 1 foot in 20 feet if a public carriage road, and 1 foot in 16 feet if a private carriage road, not being a tramroad or railroad, or if the same be a tramroad or railroad, the ascent shall not be greater than the prescribed rate of inclination ; and if no rate be prescribed, the same shall not be greater than as it existed at the passing of the Special Act.”

See also sect. 53, by which it is provided that, before interfering with roads, &c., so as to render the same impassable or dangerous, other roads shall be provided by the company.

II.

Instances where powers sought to alter Inclinations of Roads and Streets.

Although, when special powers are desired by promoters, each particular case must necessarily depend entirely on its own merits, the following instances may prove useful for reference, being those which have actually occurred on this point. In the *Fulham Railway Bill*, 1865, 127, certain owners, lessees, &c., upon a portion of the proposed line, objected to the manner in which certain roads in the district traversed by the railway were crossed ; but the Referees reported that, “as it was proved that the provisions of the General Act as to the gradients of said roads to be altered were observed ; that clauses had been agreed upon with the Metropolitan Board of Works relative to the roads in the district, and no complaint was made on behalf of the District Board, the Referees are of opinion that there are

no engineering objections to carrying out the works as proposed." In the *Garth Quarry Railways Bill*, 1865, 314, it was proposed to raise a turnpike-road 14 feet, so as to allow the line to pass under it. The Referees reported that "the effect of such raising will be to extend the existing gradient of 1 in 9, for a distance of 40 yards, upon a gradient of 1 in 10 to the top of the bridge, by which the road is to be carried over the railway, and also to convert the road at the other side of the bridge, now level, into a gradient of 1 in 30. They are of opinion that there were not any engineering objections to the raising of the road as proposed." And in the *Swansea and Clydach Railway Bill*, 1866, 263, it was objected that the works necessary for taking the railway under one of the approaches to the bridge over the River Towy (by which the roadway would be raised 4 feet over the spring of the arch), "would injuriously affect the bridge, which was built with one arch of 90 feet span, and lightly constructed." The Referees reported that the works were efficient.

Raising roadway over a lightly constructed bridge 4 feet.

III.

Instances where promoters omitted to seek powers to alter Inclinations of Roads and Streets.

See *Bedford, Northampton, and Weedon Railway Bill*, 1865, 68 (*ante*, p. 165), where the Referees reported, "No provision is made in the Bill for crossing this street upon the level; and to take the same under or over the proposed railway, would require the approaches to be made steeper than the gradient of the present road (1 in 16), for which no powers are taken in the Bill As the Bill stands, the proposed railway cannot be constructed." In the *Okehampton Railway Bill*, 1865, 92, where it appeared that Line No. 1 was intended to be constructed upon the

land purchased by the Launceston and South Devon Railway, for the purpose of doubling their line, the promoters proposed various alterations on their original plan, in order to obviate the objection ; but the Referees reported, among other matters, that the petitioners "would also most probably have to make use of the bridges constructed by the petitioners for their double line of railway ; as, in order to pass under the roads which cross over both lines, it might be necessary to alter the gradients of the approaches to the bridges, to do which no powers are taken in the Bill." In the *North Surrey Railway Bill*, 1865, 110, a line was proposed from a junction with the Balham and Croydon Line of the London, Brighton, and South Coast Railway, near the Streatham Station, to a junction with the London, Chatham, and Dover Railway at Clapham Station. The line for 2090 yards would be in tunnel or covered way, running under and along the South Road, King's Road, and Loats Road. The Referees reported that "this tunnel in one place cannot be, at the utmost, more than 15 feet high, as no powers have been taken to alter the level of the road under which it passes, and to lower the level of the rails will make the gradient (there 1 in 100) more steep." In the *Moses Gate and Ringley Branch Road Bill*, 1865, 294, which was a Bill giving fresh powers to that Road Trust, it was proposed to raise the level of the Moses Gate Road, at the extremity of the Promoters' Trust, so as to convert a gradient of 1 in 30 into 1 in 62. The level to be obtained under the powers of the Bill would terminate abruptly at the end, towards Manchester, of a bridge which was under the jurisdiction of the Justices of the Hundred of Salford ; while the access to the bridge from Bolton was in the jurisdiction of the corporation of that borough. It was therefore objected that this would involve the corporation of Bolton and the Justices of the Hundred of Salford in the raising or rebuilding the bridge ; and would also involve the corporation in a large outlay to raise the road to the bridge in that borough. The Referees reported that "the proposed alteration of the road could

not therefore be effected, without rendering the road impassable, unless the bridge and access to it from Bolton were also raised simultaneously to a corresponding level by the said justices and corporation ; that no powers were taken in the said Bill for so raising said bridge or road, which would be attended with considerable expense, as compensation would have to be paid to the owners and occupiers of the houses adjacent to the said road ; subject to this observation there are no objections, in an engineering point of view, to the works proposed.” In the *Hadlow Railway Bill*, 1866, 66, it was objected that, according to the deposited plans, Railway No. 3 would be carried over a certain road with a headway of only 4 feet ; and the promoters, in order to obviate this objection, proposed to lower the road and increase the gradient from 1 in 66 to 1 in 51. The Referees reported that, “ It was shown that the execution of the works, according to the deposited plans, would obstruct the passage of the road, and that the alteration of the gradient from 1 in 66 to 1 in 51, or the lowering of the road as proposed, cannot be carried out under the powers of the General Act, without the consent of the Board of Trade. The Referees are of opinion that the engineering details of Railway No 3, so far as they affect the said road, are objectionable.” See also *London, Brighton, and South Coast Railway (Various Powers) Bill*, 1866, 255, cited p. 164.

SECT. III.

HEADWAY, SPAN, WIDTH, ETC., OF BRIDGES UNDER AND OVER ROADS AND STREETS.

On this subject the Railway Clauses Consolidation Act, 1845, provides, sect. 49 (*a*) :

(*a*) See Railways Clauses (Scotland) Act, sect. 42, *et seq.*, for similar provisions applicable to Scotland.

Construction
of bridges
over roads.

"Every bridge to be erected for the purpose of carrying the railway over any road shall (except where otherwise provided by the Special Act) be built in conformity with the following regulations : that is to say—

Width of
arch.

"The width of the arch shall be such as to leave thereunder a clear space of not less than 35 feet if the arch be over a turnpike road, and of 25 feet if over a public carriage road, and of 12 feet if over a private road :

Height of
arch over
public roads.

The clear height of the arch from the surface of the road shall not be less than 16 feet for a space of 12 feet if the arch be over a turnpike road, and 15 feet for a space of 10 feet if over a public carriage road ; and in each of such cases the clear height at the springing of the arch shall not be less than 12 feet :

Over private
roads.

The clear height of the arch for a space of 9 feet shall not be less than 14 feet over a private carriage road."

Construction
of bridges
carrying roads
over railway.

"Sect. 50. Every bridge erected for carrying any road over the railway shall (except as otherwise provided by the Special Act) be built in conformity with the following regulations : that is to say—

Fence.

"There shall be a good and sufficient fence on each side of the bridge of not less height than 4 feet, and on each side of the immediate approaches of such bridge of not less than 3 feet.

Width of
road.

"The road over the bridge shall have a clear space between the fences thereof of 35 feet if the road be a turnpike road, and 25 feet if a public carriage road, and 12 feet if a private road."

Width of
bridges need
not exceed the
width of roads
in certain
cases.

"Sect. 51. Provided always, that in all cases where the average available width for the passage of carriages of any existing roads within 50 yards of the point of crossing the same is less than the width hereinbefore prescribed for bridges over or under the railway, the width of such bridges need not be greater than such average available width of such roads, but so, nevertheless, that such bridges be not of less width, in the case of a turnpike road or public carriage road, than 20 feet : provided also, that if at any time after the construction of the railway the

average available width of any such road shall be increased beyond the width of such bridge on either side thereof, the company shall be bound, at their own expense, to increase the width of the said bridge to such extent as they may be required by the trustees or surveyors of such road, not exceeding the width of such road as so widened, or the maximum width herein, or in the Special Act, prescribed for a bridge in the like case over or under the railway."

"Sect. 52. Provided also, that if the mesne inclination of any road within 250 yards of the point of crossing the same, or the inclination of such portion of any road as may require to be altered, or for which another road shall be substituted, shall be steeper than the inclination herein-before required to be preserved by the company, then the company may carry any such road over or under the railway, or may construct such altered or substituted road at an inclination not steeper than the said mesne inclination of the road so to be crossed, or of the road so requiring to be altered, or for which another road shall be substituted."

If road afterwards widened, bridges to be also widened.

Existing inclinations of roads crossed or diverted need not be improved.

When special powers, exceeding those provided for by the foregoing enactments, are sought, the Referees will necessarily be guided by the peculiar circumstances of each case. The following cases show the various headways which have been sanctioned for particular streets. In the *Edgware, Highgate, and London Railway Bill*, 1865, 90, in which the proposed railway would cross the Hornsey Road by a bridge of 25 feet span, and 15 feet of headway, and the Green Lanes by bridges of 35 feet span and 15 feet headway, the Referees reported that "it was not proved that the height and span of these bridges was insufficient." In the *Manchester, Sheffield, and Lincolnshire Railway (Central Station and Lines) Bill*, 1866, 297, the Referees reported that "the several bridges over the roads aftermentioned should be constructed with the several headways placed opposite them, instead of the heights shown on the deposited plans ; viz. :

	Height in feet.		Height in feet.
David Street - - - - 25		Lees Street - - - - 20	
Abingdon Street - - - - 25		Lomax Street - - - - 23	
Sackville Street - - - - 23		Mather Street - - - - 26	
Charlton Street - - - - 23		Back Mather Street - - - - 28	
Minshull Street - - - - 21		Store Street - - - - 28	
Fetter Lane - - - - 21		Meadow Street - - - - 24	
Aytoun Street - - - - 22		Worthington Street - - - - 24	
Circus Street - - - - 22		Chapel Street - - - - 20	
Piccadilly - - - - 21		Long Street - - - - 17	
Back Piccadilly - - - - 21		Watson Street - - - - 16	
Dale Street - - - - 19			

“ With these heights they will be efficient in an engineering point of view, and they can be so constructed under the powers contained in the Bill.” And in the *Same Bill*, *ibid*, the Referees also reported that “ Should Railway No. 3 be sanctioned, provision should be made that no obstruction should be offered to the widening of Watson Street to a breadth of 60 feet, as contemplated. In the *North British Railway (Glasgow Branches) Bill*, 1866, 221, the Glasgow Parochial Board objected “ that the provisions made by the promoters for carrying the railways over Carntyne and Cumbernauld Roads, and under Garngad Road, with regard to the span and headway of the bridges, were insufficient.” By certain Acts of Parliament for the regulation of roads within the jurisdiction of the petitioners, as applicable to the above roads, it was provided that no buildings should be erected within 30 feet of the centre of the two former roads, or within 25 feet of the centre of the Garngad Road, and that a headway of 18 feet had been ordinarily provided in railway bridges within the city of Glasgow. The Referees reported that this restriction as to buildings should apply to the works in question; and that these bridges should be constructed, as to the two former roads, with the span of 60 feet and a headway of 18 feet, and with a width of 50 feet as to the Garngad Road, under which the railway would pass.” And in the *Rhymney*

Railway Bill, 1866, 216, the Bill proposed to widen several bridges by which the present line is carried over several roads and streets in Cardiff, the Referees were of opinion that "in so widening said bridges, the promoters ought to be restrained from carrying any addition to the existing abutments beyond the present line or contour of the roads or footpaths crossed by the said bridges; and that, if by reason of the widening of Windsor Road Bridge, any diversion of Linton Road or the sewers now made therein should become necessary, the promoters should be bound to pay the expense thereof."

SECT. IV.

SCREENS FOR TURNPIKE ROADS.

By the Railways Clauses Act, 1845, it is provided (sect. 63) (a) that "If the Commissioners or Trustees of any turnpike road, or the surveyor of any highway, apprehend danger to the passengers on such road, in consequence of horses being frightened by the sight of the engines or carriages travelling upon the railway, it shall be lawful for such commissioners, or trustees, or surveyor, after giving 14 days' notice to the company, to apply to the Board of Trade with respect thereto; and if it shall appear to the said Board that such danger might be obviated or lessened by the construction of any works in the nature of a screen near to or adjoining the side of such road, it shall be lawful for them, if they shall think fit, to certify the works necessary or proper to be executed by the company, for the purpose of obviating or lessening such danger, and by such certificate to require the company to execute such works within a certain time after the service of such certificate, to

*Screens for
turnpike
roads.*

To be made, if
required by
the Board of
Trade.

(a) See similar provisions, applicable to Scotland, in Railways Clauses (Scotland) Act, sect. 55.

Railway
beside road
for 2 miles.

be appointed by the said board ; and sect. 64 contains a provision for penalty. In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, the promoters proposed to divert the Leeds and Collingham Road, which, when so diverted, would run close along and on the eastern side of said railway for a distance of 2 miles. The Referees reported that "this would be an engineering defect, unless a proper screen, such as may conceal such railway from view, be provided along said road." In the *Aboyne and Braemar Railway Bill*, 1865, 216, the petitioners' main objections were (1) generally that the line was laid out in such close proximity to a much-frequented public road, passing up a narrow valley by the side of the River Dee, as to render the use of that road by persons with horses and carriages incommodious and dangerous, especially where it was intended to be carried on the north side of the said road, where the road adjoins the river and is insufficiently fenced ; (2) that at a narrow part of the valley there was a sharp curve of 15 chains radius, so situated as to make it impossible to screen a train coming in the opposite direction from the sight of horses descending the road. The promoters replied, that, in a narrow valley already traversed by a road and a river, it was not possible to carry the line otherwise than as proposed ; and that, by putting screens in certain places by the side of the road, and in others by the side of the railway, the view of the trains might be effectually prevented. The Referees reported, "On the question whether the line can be worked as laid down without possible danger to the public using the road in such close proximity both to the railway and the river, the Referees pronounce no opinion ; but it was proved to their satisfaction that screens as proposed by the promoters could be erected ; and they have further to report that there are no engineering objections to the construction of the proposed line." In the *Lancashire and Yorkshire Railway (Additional Powers) Bill*, 1865, 239, it was objected "that from about 1 mile $2\frac{1}{2}$ furlongs up to 1 mile $3\frac{3}{4}$ furlongs there was a curve of 12 chains in a deep cutting, of 43 feet in some parts, and that,

at the termination of this curve, the railway would come upon a turnpike road and run parallel with it on a slightly higher level for about 60 chains, at a distance of only 30 yards." The promoters replied that the valley was only 60 yards wide, and that the proximity to the road could not be avoided. The Referees reported that "the line could not well be carried in any other way than that proposed; but they consider that a screen should be erected and kept up by the railway company (if requested to do so) between the turnpike road and the railway."

SECT. V.

LOWERING ROAD BELOW LEVEL OF ADJACENT STREAM.

To lower a road below the level of an adjoining stream, in such a way as to prevent the possibility of draining the road, would, doubtless, be considered an objection in an engineering point of view. This question arose in the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, where the Leeds and Collingham Road Trustees objected that it was proposed to lower that turnpike road 8 feet, and pass it under the railway; and it was alleged that, by such lowering, the road would be brought beneath the level of an adjacent stream; but, it having been proved that, when altered, the road would still be 12 feet above level of the stream, the Referees reported that the proposed mode of dealing with the road was not objectionable. See also the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219 (on objection of the Tadcaster, &c. Road Trustees) cited p. 168.

SECT. VI.

RAILWAY PROPOSING TO OCCUPY SITE OF ROAD.

This objection will not be sustained where, within the limits of deviation, another road sufficiently efficient can be substituted. Thus, in the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, it was objected that the centre of the railway as laid down touches the west side of the Leeds and Collingham Road, and that the slope of the cutting would extend across the same. In reply it was stated, "that the limits of deviation would allow the direction of either the railway or the road to be so altered as to avoid any interference." The Referees reported that no engineering objection existed.

SECT VII.

SHUTTING-UP STREETS—PROVIDING NEW STREET IN PLACE THEREOF.

In lines—which it is proposed to carry through or into towns, it is obvious that there must be more or less interference with the streets and possibly also with the gas, water, and drainage pipes under the streets. Whether the public advantage to result from such interference being sanctioned outweighs any inconvenience likely to be caused thereby is, of course, a question for the Committee. The Referees are only concerned with the preliminary questions of engineering and amount of estimate.

Usually when several streets are proposed to be shut up, the promoters, in order to obviate objections on that ground,

provide for the construction of one new street of sufficient width to supply the demands of the traffic which passed over the streets to be shut up. The *Caledonian Railway (Glasgow South Side Railway, &c.) Bill*, 1865, 105, affords an illustration of the spirit in which the Referees are inclined to deal with Bills of this nature. In that case the Glasgow authorities having charge of the streets, having opposed on the ground of injury to the streets and obstructions to their traffic, the Referees reported, on this point, "The company, however, would undertake to construct a new road 60 feet in width, which would, to a great extent, compensate for some of the thoroughfares which they would stop up or absorb. It may be considered also that one of the professed objects and probable results of the inter-communication of railways at Glasgow would be to relieve the traffic of the now crowded thoroughfares, and, upon the whole, the Referees consider that in case the scheme of railways proposed by the Bill should appear upon its own merits deserving of Parliamentary sanction, the interference with the streets which would be thereby occasioned may be regarded, in an engineering point of view, as of secondary importance." In the *Regent's Canal (Limehouse Basin and Cut) Bill*, 1865, 173, the Limehouse Board of Works objected "that the promoters took power to stop up several streets and alleys, particularly a part of Ristre's Ropewalk and the whole of Tyte's Alley, by which last arrangement an alternative route (which traffic might and does now frequently take to avoid passing over a fixed and narrow bridge at Limehouse Cut entrance, and where the narrowness of Narrow Street causes frequent delay), would be entirely destroyed, and the convenience of foot passengers and carriages passing from east to west by Ristre's Ropewalk and Tyte's Alley irremediably prejudiced;" they further objected that under an Act of George the Third powers were vested in them to construct a new street from Queen Street through Ristre's Ropewalk to Northey Street, which powers they intended now to exercise, but which powers the Bill proposed to repeal, thus rendering the

carrying out of a great local improvement impossible. The promoters replied that in lieu of Tyte's Alley, which was 10 feet wide, and so much of Ristre's Ropewalk (26 feet wide in some parts as would be stopped up, they proposed to substitute a new street of 30 feet in width throughout and to widen Narrow Street, which was in the widest part only 25 feet wide, to an uniform width of 30 feet ; and that this new street would answer all the objects of the street which the petitioners were proposing to construct. The Referees reported on this point, that "the new street would, by the stopping up of an alternative route, and rendering the larger improvement impossible, only in a limited degree relieve the existing crowded state of the thoroughfares ;" and that subject to this observation, there were no engineering objections to the works proposed. In the *Midland Railway (New Lines, &c.) Bill*, 1865, 223, the Corporation of Bradford complained that the promoters proposed to stop up and discontinue, and appropriate to the purposes of their undertaking, a street in Bradford, called Commercial Street, and also a public footpath. The petitioners stated that Commercial Street was an important public street, and afforded the most convenient access from that part of the borough which is situate towards the south of the Midland Station with Railroad Street Canal and Leeming Street, and the district of the borough lying to the north-east of the said station. Commercial Street has a descending gradient of 4 feet towards Railroad Street and Canal Street ; but if it were stopped up, the traffic from the south-west must be carried a greater distance to these streets by passing along Mill Street and up School Street, which has a gradient of 1 in 13. The footpath ran alongside of and might be considered part of Commercial Street. The promoters represented that the increase of distance by Mill Street would not be above 30 yards, and that the gradients of School Street would be to some extent, improved by widening it as proposed, to 70 feet at one end and 90 feet at the other. The Referees reported that "there were no reasons, in an engineering point of

view, for stopping up Commercial Street and the footpath." In the *Edinburgh and Glasgow Railway (No. 2) Bill*, 1865, 359, it was proposed to stop up the northern portion of Hunter Street, Glasgow (which was the main connecting street between Duke Street and Gallowgate, two of the leading thoroughfares and centres of population in Glasgow, there being no other connecting street between it and High Street, which was distant 600 yards), and it was proposed to substitute a new street in continuation of Barrack Street for it. The Referees reported, "This will move the point of connection between Duke Street and Gallowgate, about 166 yards further to the east in Gallowgate, and 60 yards to the east in Duke Street from the existing point, and so much the more distant from High Street. From the proposed railways being in cutting, where they cross Hunter Street and the works of the Glasgow Union Railway, which have been previously sanctioned, it will be impossible to carry Hunter Street either over or under the proposed railways; and there are no engineering objections to the construction of the railways in manner proposed." In the *Lancashire and Yorkshire Railway (West Riding Branches) Bill*, 1866, 161, it was objected that it was intended to stop up a part of Oxford Street, in the town of Huddersfield. The Referees reported that "Evidence was given that this street can, if required, be kept open by covering it over for a length of 150 feet, preserving its present breadth, and leaving a clear headway of at least 18 feet." In the *Manchester, Sheffield, and Lincolnshire Railway (Central Station and Lines) Bill*, 1866, 261, the Corporation of Manchester and others objected that Railway No. 1 would cover Smith Street for a length of 220 feet. The promoters expressed their willingness, if required, to construct a new street in lieu of Smith Street. It having also been objected that Albion Street would be narrowed 2 feet 4 inches where it was to be crossed by the line, and the promoters having undertaken to preserve the existing width of that street, the Referees reported, "With these alterations there are no engineering objections to Railway No. 1."

SECT. VIII.

INTERFERENCE WITH GAS, WATER, AND DRAINAGE PIPES.

Altering position of water and gas pipes.

"It shall be lawful for the company for the purpose of constructing the railway, to raise, sink, or otherwise alter the position of any of the water courses, water pipes, or gas pipes belonging to any of the houses adjoining or near to the railway, and also the mains or other pipes. . . ."

(Railways Clauses Act, 1845, (a) Sect. xviii.) "Provided always that it shall not be lawful for the company to remove or displace any of the mains or pipes, (other than private service pipes) syphons, plugs, or other works until good and sufficient mains, or pipes, syphons, plugs, and all other works necessary or proper for continuing the supply of water or gas shall, at the expense of the company, have been first made and laid down in lieu thereof." (Sect. 19.)

Section 20 provides that such pipes shall not be laid down contrary to the regulations of any Act relating to water or gas, and that it shall not be lawful to cause any road to be lowered without leaving a covering of not less than 18 inches over such mains or pipes.

By section 21 the company are to make good all damage to water and gas companies' property, and to make full compensation to all parties for any loss or damage to them by reason of interference with mains or pipes, or with the private service pipes. And section 22 provides that when a railway passes over such mains or pipes, the railway company shall construct a sufficient culvert so as to leave the same accessible for the purposes of repairs.

See also section 53, which provides that before roads are interfered with, so as to render the same impassable or dangerous, other roads shall be provided by the company.

Before disturbing pipes, others to be laid down.

"(a) See Railways Clauses (Scotland) Act, sect. 18, *et seq.*)

Pipes not to be laid contrary to Acts, and 18 inches surface to be retained.

(Sect. 19.)

Damage to water and gas companies to be made good.

Section 20 provides that such pipes shall not be laid down contrary to the regulations of any Act relating to water or gas, and that it shall not be lawful to cause any road to be lowered without leaving a covering of not less than 18 inches over such mains or pipes.

When railway crosses pipes culvert to be made.

By section 21 the company are to make good all damage to water and gas companies' property, and to make full compensation to all parties for any loss or damage to them by reason of interference with mains or pipes, or with the private service pipes. And section 22 provides that when a railway passes over such mains or pipes, the railway company shall construct a sufficient culvert so as to leave the same accessible for the purposes of repairs.

(a) See Railways Clauses (Scotland) Act, sect. 18, *et seq.*

In the *Caledonian Railway (Glasgow South Side) Railway, &c., Bill*, 1865, 106, one of the grounds of opposition urged by the Glasgow authorities having charge of the streets and sewers, was, "the interference with the drainage of the city, which the works, if executed, might occasion." The Referees reported that "any interference that might be caused by the construction of the proposed works, would admit of remedy which might, under proper regulations, be applied ; and which, in the event of the works being sanctioned, should be made obligatory upon the company." In the *Edinburgh and Glasgow Railway (No. 2) Bill*, 1865, 359, the Corporation and Board of Police of Glasgow objected that by the construction of said railway, "the proper drainage and sewerage of district to the north thereof would be prevented." The Referees, in this instance, indicated the remedy, reporting that "By the construction of an intercepting sewer at the north side of No. 1 Railway, the drainage of the district in question can be completely preserved and carried into the existing outlets." And see *London, Chatham, and Dover, and South Eastern (Kennington, Clapham, and Brixton) Railways Bill*, 1866, 163, (Chap. x.) where, in regard to a tunnel of 1,293 yards, it was objected that the difference between the level of the rails and that of the neighbouring sewer would be such as to render the drainage difficult and defective.

SECT. IX.

LAYING A TRAMWAY IN A NARROW STREET.

The Referees considered this objectionable in the *Great Western Railway (Further Powers) Bill*, 1866, 233, where it was objected that Tramway No. 2 would pass along St. Martin's Street, the width of which was only 20 feet 6 inches, including footways of, together, 6 feet 6 inches,

and would seriously interfere with the use of the street. The Referees reported "that the works of Tramway No. 2 would seriously interfere with the use of the street, and endanger the safety of the public, and therefore, in an engineering point of view, are inefficient."

SECT. X.

SWING BRIDGES IN CROWDED THOROUGHFARES.

In the *Regent's Canal (Limehouse Basin and Cut) Bill*, 1865, 173, which was a Bill to authorise the proprietors of the Regent's Canal to improve their Limehouse Basin, and to make a new entrance thereto from the Thames, and for other purposes, the Limehouse Board of Works and certain owners and occupiers in the parish objected "that the proposed construction of another swing bridge would greatly aggravate the inconvenience already sustained by the petitioners, who had now to use two swing bridges." The promoters answered "that the opening bridge will be over the dock chamber, the area of which will allow many barges and vessels to be above the bridge, which will not be kept open for more than twelve minutes at one time, and that a platform will be constructed for foot passengers on the dock gates." The Referees reported that "unless some very strong necessity for the construction of the proposed works be shown to the satisfaction of the Committee, the introduction of a third swing bridge into these crowded thoroughfares . . . would be a very serious interruption to the use of the streets."

SECT. XI.

IMPROVEMENT BILL—WIDTH OF A PROPOSED NEW STREET
IN THE METROPOLIS.

In the *Piccadilly and Park Lane New Road Bill*, 1865, 196, by which it was proposed to open a communication through Hamilton Place, between Park Lane and Piccadilly, the width of the new roadway would allow no more than 28 feet 4 inches at the narrowest point for the carriage-way, measured between the kerbstones. The Referees reported "that these dimensions may no doubt be regarded as less ample than, with a view to public convenience, might be desired. It should, however, be observed, that the proposed width is the utmost that can be afforded between the houses on either side of Hamilton Place, as they now stand, and that greater width could not be obtained without sacrificing property of large value. It appears to the Referees, under the circumstances, that the question in this respect is not to be regarded as one of mere engineering merits or details, but involves considerations affecting the expediency of the proposed route, and the general merits of the scheme, which belong properly to the Committee on the Bill, and not to the Referees."

SECT. XII.

PROPOSED STATION 120 FEET BELOW STREET.

In the *Edgware, Highgate, and London Railway Bill*, 1866, 193, it was objected that the line (to Barnet) would be constructed in such a manner that the station would be in a deep cutting, and 120 feet below the main street of

Barnet. The promoters proved that this street descended in a direct line with a steep gradient to the same level as the proposed railway at the point where the station was intended to be erected. The Referees reported that there was no engineering objection. (a)

(a) "The nature and magnitude of the traffic likely to occur, and the peculiarities of site and locality for the intended station, involve the main considerations, and must determine most of the details required. The site may be determined by the contiguity of the town or place to be accommodated, facility or economy of purchase, &c.; and besides these, the question of relative levels arises, and deserves most especial regard. Indeed, the commercial value of the station may be said to be made or marred by the facility or the difficulty of communicating with the adjoining thoroughfares. Whether the station is above or below the neighbouring level, a similar amount of expense and trouble will be incurred in transferring the luggage, and of inconvenience in transferring the passenger traffic."—*Dempsey's Practical Railway Engineer*, 4th edit. p. 290—1.

CHAPTER VIII.

TIDAL AND NAVIGABLE WATERS.—WORKS IN, ON, AND OVER SAME.—OBSTRUCTION TO NAVIGATION.—RECLAMATION BILLS.

SECT. I.

BRIDGES OR VIADUCTS OVER TIDAL OR NAVIGABLE WATERS.

The objections, which it is possible to take to such bridges, are numerous ; and have reference to such matters as span, headway, foundations, material, effect on the channel, silting up of sand, and interference with navigation generally.

In reference to the span of such bridges, it is provided *Span.* by the Railways Clauses Act, 1863, sect. 14 :—

“Where the company is authorised, or required by the special Act to construct a bridge over a navigable tidal water, and the special Act does not make express provision respecting the span or spans thereof, then the company shall construct the same with a span or spans of such headway and waterway, and with such opening, span, or spans (if any), and according to such plan, as the Board of Trade directs or approves.”

The amount of headway desirable must depend upon the *Headway.* class of vessels navigating the water. See the several cases noticed in the sequel.

The first important case, of this class, with which the

compel the larger class of vessels to lower their topgallant masts, in order to pass under ; which would give rise to delay and inconvenience, loss of the tide, &c. ; and would result in a diminution of the trade of Gloucester. The Referees, after much conflicting evidence, reported that, (1) as regards the restriction of the waterway, they had "not been led to conclude that any material addition to the dangers of the Severn or any inconvenience too great to be reasonably imposed upon those who make use of the navigation, would be occasioned by the proposed structure, in case the general interests of the public justify the interference. It would add to the risks of the river in bad weather, and in times of fog ; and it might interfere with the navigation during the night, a practice which is said to be occasionally resorted to by small vessels. Some inconvenience might also be caused to vessels beating against a headwind, and standing out over the sands. The additional dangers which might arise from these causes do not, however, appear to the Referees to be serious. The position of the bridge in a straight reach some length, and in a part where the channel appears from the charts to have been for a long time constant, is favourable for the purpose. The span of the main arch, 600 feet in width, exceeds that of any bridge in the Kingdom, and is considerably wider than the actual channel in some parts of other navigable rivers ; and, assuming the use of lights (*a*) and other suitable precautions, the risk of collision with the piers does not appear to justify serious apprehensions : (2) As regards the headway, assuming, as it appears fair to do upon the balance of evidence, the minimum period of one hour before high water as the time at which vessels going up would reach the site of the bridge, the available headway at spring tides would range from 104 feet 3 inches to 109 feet 5 inches, according to the height of the tides. The former figure is calculated upon the highest tide ever observed of late years. It is admitted, on the part of the promoters, that vessels beyond a

(*a*) The Board of Trade have power to require lights to be exhibited on all such works. See *Railways Clauses Act*, 1863, sect. 13.

certain size—which may be taken at 400 tons register—could not pass under without lowering their top-gallant masts. The evidence is very conflicting as to the existing practice in this respect, and also as to the degree of inconvenience and delay involved in the operation. Upon the whole, the Referees are led to believe that the masters of vessels going up to Gloucester seldom lower their masts ; and that they feel considerable repugnance to being compelled to do so. Under certain circumstances, with a short crew, and under pressure to save a tide, the obligation would probably be inconvenient ; and it might be seriously so in the case of vessels of large burden, when the top of a spring-tide might be incurred. On the other hand, it is enforced as a rule in some harbours ; and was so, until within a few years, at Gloucester. It is necessarily done at the Menai Straits, where the height of the Britannia Bridge is 100 feet above ordinary spring tides. It was proved to the Referees that this bridge had not prevented the resort to the port of Carnarvon of vessels of as large tonnage as those which now go to Gloucester. Though the practice may involve some trouble and occasional delay, it cannot be regarded as a serious impediment to navigation.” The Referees’ report then proceeds to notice the statistics of the shipping of the Port of Gloucester, and the number of vessels which in the course of a year would probably be put to the necessity of lowering their top-gallant masts ;—which number they placed at 67. (See further, 1865, 357.) And in the *Severn Junction Railway Bill*, 1865, 361, it was proposed to cross the River Severn by a high level bridge of 16 arches—2 of 200 feet span, 1 of 150 feet span, and 13 of 100 feet span ; the maximum headway being 68 feet, the minimum 50 feet. The Corporation of Gloucester and several other petitioners alleged that the proposed bridge would be dangerous to the navigation, prejudicial to the course and conformation of the river ; and would be the cause of serious obstruction to a large and important river traffic. The opponents contended that the width of the spans was insufficient ; that the sands and rocks at the site

As to lowering
top-gallant
masts.

Severn Bridge,
No. 2.

of the proposed bridge caused, at all periods of the tide, eddies and dangerous whirls, which the bridge would increase ; that it would lead to the formation of fresh sand banks, and possibly change the position of those already existing. They further contended " that the headway proposed would necessitate the striking of the topmasts of all vessels passing under the bridge, and thus deprive them of the use of a portion of their sails, which might place them in a position of danger." The promoters offered evidence to show that the indisputable channel of the river was on the Welsh shore. The Referees reported that, " should the Committee allow the scheme to proceed, the promoters should be legally bound to construct the second arch of the bridge, from the western or Welsh shore, of a span of 300 feet, and the third arch of a span of 180 feet. Should this requirement be carried out, there would be no engineering objection to the construction of the proposed bridge."

Opening Bridges.—In the *Fareham and Netley Railway Bill*, 1865, 72, it was proposed to cross the Hamble, a tidal river, by a viaduct. The owners of wharves and quays and the Southampton Harbour Board alleged, that the viaduct would create a serious obstruction to the great majority of vessels now trading up and down the river. The viaduct would consist of 17 arches of 30 feet span, which would afford a maximum headway of 46 feet at low water spring tides, and of 19 feet at high water spring tides. The promoters proposed to make, in the viaduct, an opening bridge of 40 feet span. The estimate was sufficient to cover the expense of the same, or of such other Bridge as the Board of Trade might require. The petitioners disputed the sufficiency of the proposed bridge, the Hamble being navigated by vessels of from 100 to 400 tons, having a beam of from 21 to 28 feet ; steam tugs being also employed, having a breadth of from 36 feet to 38 feet 4 inches. The Referees reported that, " were an opening bridge of 40 feet in width only constructed, the navigation would be seriously interfered with and materially obstructed." In the *Furness Railway Bill*, 1865, 79, Railway No. 1

would be carried across the Duddon Estuary by a viaduct, 2,618 yards long, of open piling throughout, with an opening bridge of 36 feet span. The channel of the river, where it was proposed to place the viaduct, had shifted to the northward 700 feet since the year 1843, and it was alleged that its tendency was still to shift ; but it was proposed to fix the channel to the site where the opening bridge is to be made, by consolidating the remainder of the sands beneath the viaduct by the deposit of stone, so as to prevent the river from cutting a new channel. The proposed opening of the bridge was also alleged to be much too narrow, and it was proved that there was a large and increasing trade with the Harbour of Borwick. The Referees reported that, "in an engineering point of view, the proposed opening is insufficient, and the works will be defective, unless such an opening bridge be constructed therein, as the Board of Trade may think requisite, for the preserving of free navigation to Borwick Harbour." In the *Aberystwith and Welsh Coast Railway Bill*, 1865, 293, a proposed viaduct over the River Dovey was objected to as obstructing the waterway, and on the ground that the opening bridge proposed therein, of 25 feet span, was insufficient for the purposes of navigation. The promoters expressed their willingness to substitute an opening bridge of any width, which might be directed by the Board of Trade ; and, with this provision, the Referees reported that there were no engineering objections.

By the 14th section of the Railways Clauses Act, 1863 (*supra*), the Board of Trade have power to order the construction of opening span or spans in bridges over tidal waters, in cases where the spans, &c., of such bridges have not been the subject of express enactment in the special Act. Section 15 provides that, "Where the company constructs a bridge with an opening span, it shall not be lawful for the company to detain any vessel, barge, or boat at a bridge, for a longer time than may be necessary for admitting a carriage or engine traversing the railway and approaching the bridge to cross the bridge, and for opening the

River Dovey
Viaduct.

When Board
of Trade may
require
opening spans.

Bridge with
opening span.

Vessels not to
be unduly
detained.

bridge to admit the vessel, barge, or boat to pass; and the company shall be subject to and shall abide by such regulations, with regard to the use of the bridge, as may from time to time be made by the Board of Trade." (*Here follows provision for Penalty.*)

SECT. II.

EMBANKMENTS ACROSS OR ALONG TIDAL WATERS.

In the *Whitehaven and Furness Junction Railway Bill*, 1865, 80, the Furness Railway objected, that it was proposed to carry the line across the Duddon Estuary for upwards of $2\frac{3}{4}$ miles, upon a solid embankment, with only 350 yards of open viaduct, and that, if so constructed, the effect of the works would be to silt up the sands above the embankment, diminish the area of the tidal basin, and eventually injure materially the Duddon and Barrow channels. The promoters admitted that some silting would take place. The Referees reported that, as the amount and effect of such silting must be very doubtful, they were of opinion, that the engineering works would be defective, unless the Board of Trade were empowered to require that an open viaduct should be substituted for so much of the said solid embankment as they might think requisite. They further reported, that the estimate was sufficient for the works as proposed, and that some margin had been provided for contingencies ; but that, if an open viaduct should have to be substituted for a large portion of the embankment, the sum estimated would be insufficient to defray the increased cost. In the *Connah's Quay Railway and Docks Bill*, 1865, 258, it was objected, that the continuation of a certain guide-wall or embankment in the River Dee, below Connah's Quay, would so contract the entrance of the River Dee, as to render the navigation thereof dangerous ; but the promoters agreed to alter the direction of said guide-wall or embank-

Duddon
Estuary
Embankment.

Embankment
in Dee below
Connah's
Quay.

ment so as to obviate the objections of the petitioners. The Referees reported that, "if the said guide-wall or embankment be constructed in such place as may be agreed upon with the petitioners, there would not be any engineering objections thereto." In the *Aberystwith and Welsh Coast Railway Bill*, 1865, 293, it was objected that by the construction of a certain embankment along the estuary in front of Aberdovey, vessels would be compelled to lie upon shifting sands instead of the hard beach, upon which they can now lie; but it was replied that, if it should be found that vessels should so be removed to the sandy places, the same could be rendered firm by the laying down of rubble, which could easily be procured in the vicinity. With this provision, the Referees reported that there were no engineering objections to the construction of the proposed embankment.

Aberdovey Embankment.

See as to the reclamation of tidal lands, p. 206.

SECT. III.

TUNNELS UNDER RIVERS, TIDAL WATERS, AND CANALS.

In the *Birkenhead and Liverpool Railway Bill*, 1865, 285, it was proposed to construct a tunnel between Birkenhead and Liverpool, under the Mersey. The Referees reported, that evidence had been given that extraordinary difficulties might be encountered by the meeting with faults, and strata charged with water, or other serious obstacles in the execution of the tunnel; and that it was possible that such extraordinary difficulties might arise; but that they were of opinion "that the occurrence of them will be so uncertain that it would not be just to require the promoters to provide against them in their estimate." In the *North Wales and Birkenhead and Liverpool Railway Bill*, 1866, 106, the company proposed to carry Railway

Mersey Tunnel.

Dee Tunnel
(No. 1).

No. 1 under the River Dee, at right angles, by a tunnel of 400 yards long, at a point about half a mile below Ashton Quay, where the waterway is 150 yards wide. The part of the tunnel beneath the bed of the river was to be constructed of brickwork, within a timber cofferdam, in three successive portions, by which a third of the waterway would at one time be occupied ; and it was proposed to secure a sufficient depth for the passage of vessels during the construction of the centre portion by excavating the foreland on the Flintshire side. It was proved that these works during their construction would seriously impede the navigation of the river, by narrowing the channel and by increasing the velocity of the current ; and that the bed of sand, through which the tunnel would be carried, was of so volatile a character as to render the construction of both the tunnel and the approaches exceedingly difficult. It was also proved that the calculations on which the estimate was based, while sufficient for works of an ordinary description, were not such as to provide for the effective execution of these works, either in respect of the construction of the tunnel or the maintenance of the slopes of the approaches to it. The Referees reported that the works were inefficient, and the estimate insufficient. In the *Wrexham, Mold, and Connah's Quay and Hoylake Railways Bill*, 1866, 107, another tunnel under the River Dee was proposed, 352 yards in length, about a mile above Connah's Quay, and close to the mouth of the Wepre Brook. The part of the tunnel beneath the bed of the river would be constructed of brick, lined throughout with an iron casing, rendering it watertight, within a cofferdam of iron cylinders ; and the work would be carried on in such successive portions as might be found necessary. No objection was taken to the efficiency of the proposed works or to the estimate ; but the petitioners alleged that the navigation of the River Dee would be materially interfered with during the construction of the works, and that permanent injury would result to the bed of the river. The promoters stated that the works would be so carried on as to secure a waterway

Dee Tunnel
(No. 2).

of never less than 300 feet, and a navigable channel of 200 feet wide. The Referees reported "that this arrangement would afford a sufficient temporary accommodation for the navigation; and that, after the completion of the works, the bed of the river would not be injuriously affected. The promoters stated that the construction of the works necessitating the occupation of the bed of the river in the manner described, would be completed within a period of 18 months; and the Referees are of opinion that the time for the execution of these works should be limited." See also the *Brecon and Merthyr Tydfil Junction Railway Bill*, 1865, 425 (p. 88), in which it was proposed to carry the line under the Glamorganshire Canal at a depth of 16 feet below the bottom of the water, it was objected that the traffic of the canal must necessarily be stopped during the construction of the proposed bridge under the canal, and that no provision had been made by the promoters to obviate this difficulty; but the promoters proved that, during the construction, no interference would be caused to the traffic.

Limiting time
during which
bed of river
to be occu-
pied.
Tunnel under
Glamorgan-
shire Canal.

SECT. IV.

SINKING CYLINDERS IN NAVIGABLE RIVER TO FORM SUBWAY.

In the *Thames Subway Bill*, 1866, 429, it was proposed to construct a subway from Deptford, under the Thames, to the Isle of Dogs. The Referees reported that there were no engineering objections to the works proposed; that they would be efficient for their object; and that there would not be any material obstruction to navigation during the construction of the works.

Thames
Subway.

SECT. V.

INTERFERENCE WITH ANCHORAGE GROUND.

In the *Bute Docks, Cardiff* (No. 1) Bill, 1865, 305, the Glamorganshire Canal Company objected that the proposed works "would injure the access to the petitioners' canal, and interfere with the anchorage ground of vessels." The Referees reported "that the proposed works might, under certain conditions of wind and tide, slightly interfere with the passage of small vessels to or from the entrance to the Glamorganshire Canal; but that very few and only small vessels ever take such a course as could be so interfered with;" that "the proposed works will occupy a portion of the foreshore of Cardiff Flats to the extend of 112 acres, but the works lie entirely within the half tide line within which few vessels ever lie; and the Referees are of opinion that there will not be any substantial interference with the anchorage ground." See also the *Buckley Railway (Docks, &c.) Bill*, 1866, 105 (*infra*, p. 202); the *Llanelly Railway and Dock Bill*, 1866, 271 (*infra*, p. 203); and the *Holderness Embankment and Reclamation Bill*, 1866, 507 (*infra*, p. 207).

SECT. VI.

POSSIBLE SILTING UP OF SAND, ETC.

On this subject see *Furness Railway Bill*, 1865, 79, cited p. 194; *Whitehaven and Furness Railway Bill*, 1865, 80, cited p. 196; *Dee and Mersey Junction Railway Bill*, 1865, 269, cited p. 190; *Severn Junction Railway Bill*, 1865, 361, cited p. 193; *Llanelly Railway and Dock Bill*, 1866, 271, cited p. 203; *Holderness Embank-*

ment and Reclamation Bill, 1866, 507, cited p. 207; and the following cases : In the *South Wales and Great Western Direct Railway Bill, 1865*, 353, (see facts stated p. 191) the Referees observed in their report, "Some evidence was given by the opponents as to the physical effect likely to be produced by the interposition of so large an amount of solid structure in the waterway upon the sands in the bed of the river, and eventually upon the course of the channel itself. The extent to which such an influence might operate was admitted to be problematical. That some effect is likely to be produced by the altered action of the current upon the bed of the river, appears highly probable. Such a result must follow, more or less, from the construction of every bridge fixed upon piers in a river. In the present instance, the evidence offered was not such as to satisfy the Referees that any extensive change was likely to result which ought to form an objection, *per se*, to the proposed structure." In the *Bute Docks, Cardiff, (No. 1) Bill, 1865*, 305, the Penarth Harbour, &c. Company objected (1) that the execution of the proposed works would tend to the silting up of the access to the petitioners' harbour ; and (2) that if the promoters should apply to the purposes of their dock any portion of the waters of the River Taff, the petitioners' undertaking would be injured. The Referees reported "that there is at present a certain amount of silting going on, on the Penarth and East Mud-flats, but they do not think that the execution of the proposed works will have any sensible effect upon the same." "That should any part of the waters of the Taff be diverted for the use of the proposed dock, an injury will be caused to the Penarth Dock by the probable silting up of the entrance to the same. But the undertakers declare that it is not their intention to divert any of the said waters ; and no powers are taken in this Bill to do so." The estimate was, however, reported insufficient. The *Bute Docks, Cardiff, Bill, 1866, 122*, was again opposed by the Penarth Harbour, &c. Company, who alleged that the construction of the proposed basin and dock would injure the lying ground on Cardiff

Flats at present used by shipping ; and that the works and dredging proposed to be executed would tend to silt up the access to their docks ; and that the taking of water for the use of the docks, by means of a certain feeder, would tend to cause the silting up of the channel of the Taff and estuary. The Referees reported that the construction of the works would not cause any injury to the lying grounds on Cardiff Flats, nor would they produce any injurious effect upon the access to Penarth Docks : that "should a large portion of the annual flow of the Taff, especially of the flood waters, be taken, a silting up of the channel and estuary might to some extent be caused ; but it was proved "that although the feeder, in very dry weather, does take all the waters of the Taff, yet the entire amount of water which will be annually taken bears so small a proportion to the whole quantity which passes down the Taff, that the abstraction of water proposed will have no appreciable effect on the channel or estuary."

SECT. VII.

PROPOSED DOCKS OR PIER INTERFERING WITH NAVIGATION.

In the *Buckley Railway (Docks, &c.) Bill*, 1866, 105, the Corporation of Chester alleged that the construction of the walls of certain docks &c. would materially interfere with the navigation of the river, by contracting the sectional area of the waterway, and thereby increasing the velocity of the current ; and that the accommodation for mooring and anchorage would be reduced. The Referees reported that, although the velocity of the current would be somewhat increased by the construction of the walls, as shown in the deposited plans, the advantage gained by the removal of the groins, and the consequent improvement of the navigable channel, would compensate for this objection ;

Contracting
waterway
Increasing
current.

Anchorage,
&c., reduced.

that, to secure the increased width of the channel, they considered that the foot of the sloping wall on the north side should not be extended into the river beyond a certain point ; that the promoters were willing to provide for mooring and anchorage ; and that they were of opinion that mooring posts should be placed along the walls at intervals, and facilities be given for their use.

In the *Llanelli Railway and Dock Bill*, 1866, 271, the Swansea Harbour Trustees objected that the proposed pier to the Mumbles would obstruct and divert the set of the tide round Swansea Bay, and through the inner and outer sounds at the Mumbles Head ; that by this interference the shoal on the Mixon Sands would be further raised ; and that by this pier the navigation would be obstructed, and the passage of vessels approaching and leaving the inner roadstead rendered difficult. The promoters stated that the pier was to be constructed of open timber-work, so as not to interfere with the set of the tide ; that it was to be 180 yards in length ; and that a channel 200 feet wide would be dredged from it seaward, so as always to secure a depth of 12 feet at low water. The Referees reported that "if the pier is not carried out beyond the length above-stated, it will have no injurious effect upon the anchorage ; and that, as by the 19th clause of the Bill the pier cannot be extended without the approval of the Board of Trade, the navigation will, by such provision, be sufficiently protected."

Diverting set
of the tide.

Increasing a
shoal.

Navigation
obstructed by
pier.

SECT. VIII.

PROVISIONS OF GENERAL ACT OF 1863, AS TO WORKS IN OR ACROSS TIDAL WATERS, ETC.

The construction of works in and over tidal waters has been fenced about by the legislature with a number of pro-

visions calculated to secure the safety and efficiency of such works.

The 14th and 15th sections of the Railways Clauses Act, 1863 (*a*)—as to the spans of bridges and the power of the Board of Trade to order the construction of opening bridges; and as to the detaining of vessels at opening bridges—are noticed in sect. 1 of this chapter.

By sect. 13 of the same Act it is provided—

“ PROTECTION OF NAVIGATION.

Lights on
works in or
over tidal
waters.

“ Where the company is authorised by the special act to construct, alter, or extend any work on, in, over, through, or across tidal lands or a tidal water, the company shall, on or near the work, during the whole time of the constructing, altering, or extending thereof, exhibit and keep burning, at their own expense, every night from sunset to sunrise, such lights (if any) as the Board of Trade from time to time requires or approves; and (notwithstanding the enactments for the time being in force respecting lighthouses) shall also on or near the work, when completed, always maintain, exhibit, and keep burning, at their own expense, every night from sunset to sunrise, such lights (if any) for the guidance of ships as the Board of Trade from time to time requires or approves. If the company fails to comply in any respect with the provisions of the present section, they shall, for each night in which they so fail, be liable to a penalty not exceeding twenty pounds.”

Access to shore
under or across
railway.

By sect. 16 it is provided that where the railway cuts off access between the land and tidal waters, the company shall make and maintain, free of toll or other charge, all such footways and carriageways over, under, or across the railway, or on a level therewith, as the Board of Trade from time to time directs or approves.

Prohibition of
deviation.

Sect. 17 contains a prohibition of deviation of railway skirting tidal waters, without consent of Board of Trade. (See this section *in extenso*, p. 30.)

(*a*) This Act extends to Scotland.

Sect. 18 empowers the Board of Trade to abate or remove works on tidal lands abandoned or suffered to fall into decay. Removal of abandoned or decayed works.

Section 19. "If at any time the board of trade deems it expedient, for the purposes of the special act or of this part of this act, to order a survey and examination of a work constructed by the company on, in, over, through, or across tidal lands or tidal water, or of the intended site of any such work, the company shall defray the expense of the survey and examination ; and the amount thereof shall be a debt due from the Company to the crown, and be recoverable accordingly, with costs, or the same may be recovered, with costs, as a penalty is recoverable from the company."

The 16th section (*a*) of the Railways Clauses Act, 1845, giving general powers to companies for the execution of works, enacts, *inter alia*.

"They may alter the course of any rivers not navigable, brooks, streams, or watercourses, and of any branches of navigable rivers, such branches not being themselves navigable, within such lands, for the purpose of constructing and maintaining tunnels, bridges, passages, or other works over or under the same ; and divert or alter, as well temporarily as permanently, the course of any such rivers or streams of water, roads, streets, or ways, or raise or sink the level of any such rivers or streams, roads, streets, or ways, in order the more conveniently to carry the same over or under or by the side of the railway, as they may think proper.

(*a*) See similar provision in the Railways Clauses (Scotland) Act, sect. 16.

SECT. IX.

PROPOSED RECLAMATION OF TIDAL LANDS.

The *Metropolis Sewage and Essex Reclamation Bill*, 1865, 117, was a Bill for reclaiming, from the sea, certain sands on the east coast of Essex; for making conduits from the North London Main discharging sewers to the coast of Essex; for utilising the sewage of North London, and for

Objection that other purposes. The Corporation of London objected that sands unstable.

the Maplin and Dengie Sands to be retained were so loose and unstable that the embankments could not be constructed upon them, unless at a much greater cost than the estimate would provide for, while they would neither be able to resist the sea on so exposed a coast, nor to prevent the filtration of the sea-water under them. They also objected that there was not sufficient fall in the conduits for the proper flow of the sewage. The Referees in their report detail the proposed arrangement of conduits and pumping stations; and reported that, "As the pumping stations on the main conduit will raise the sewage 32 feet (20 and 12 feet respectively), while the distance the sewage is to be

Fall of 1 foot
per mile.
Velocity $1\frac{1}{2}$
mile per hour.

conveyed in a direct line is 44 miles, there will be a fall of about 1 foot per mile to the points of discharge, which will give a velocity of about $1\frac{1}{2}$ mile per hour. This fall and velocity are sufficient for the proper flow of the sewage."

Extent of embankments.

In regard to the embankments, the Referees reported that on the Maplin Sands it was proposed to enclose an area of 5,000 acres, by an embankment 12 miles in length; and that on the Dengie Sands it was proposed to enclose an area of 3,000 acres by a similar embankment of 9 miles in

Distance of embankments from present coast line.
Height of embankments. 9 feet of water on same at spring tides.

length; that these embankments were to be placed from $1\frac{1}{2}$ to 2 miles seaward of the present coast line; that they would be 15 feet in height towards the sea, and would vary at the ends from that height to 6 feet, where they join the present sea-walls; that there would be 9 feet of water on

the embankment at spring tides ; that the sand was of the same description at both places ; and that it was proved that it was solid and tenacious, having a considerable admixture of clay and other substance in it, which render it sufficiently firm for the construction of the embankments upon it ; that there were no quicksands, and that it was not likely that there would be filtration from the sea under the embankments to any great extent ; that the estimate was £2,100,000 ; and that they were of opinion that there were no objections in an engineering point of view to the proposed works, and that the estimate was sufficient.

Sands solid
and tenacious.

No quick-
sands.
Filtration
under em-
bankment not
likely.
Report in
favour.

In the *Holderness Embankment and Reclamation Bill*, 1866, 507, the Referees reported that “the proposed works will not cause any deterioration in the main channels of the Humber, nor in the entrances thereto, nor will they cause any injury to Spurn Point, either by cutting it away or causing it to elongate to the southward. But, as apprehensions are entertained by the Board of Trade as to the effect of the works, it would be advisable, should this Bill pass, that the promoters should be put under terms to make and maintain such works at Spurn Point, as may be found necessary for the safety of the lighthouses, when required so to do by the Board of Trade. And the promoters have expressed their willingness to insert a clause in the Bill to that effect. From the evidence given, the Referees are of opinion that the North Channel is at present silting up ; and that the effect of the proposed works would be to accelerate such silting. That it is at present resorted to as an anchorage by fishing vessels and small craft, there being a depth of water there at low water of from 12 to 6 feet for 1,500 yards from its entrance. The Kilnsea Flats are at present used as a laying place by coasting and small craft in considerable numbers ; and the proposed works would to a great extent deprive such craft of such laying place. Partington Channel is already considerably silted up and likely to become useless in a short time. The Referees are of opinion that the estimate is not sufficient for the execution of the proposed works.”

Safety of
light-houses.

CHAPTER IX.

POWERS TAKEN BY THE BILL INSUFFICIENT FOR THE CONSTRUCTION OF THE PROPOSED WORKS.

The Referees, having no power to insert clauses, cannot look beyond the Bill, as it comes before them, and the general Acts, for the intended powers of the promoters. If, therefore, in order to accomplish their object, it should be necessary for the promoters to construct any work, effect any junction, acquire any running powers, or make any alteration on the works as laid down on the deposited plans, which work, junction, or other matters are not specially authorised by the proposed Bill, and are not within the powers of the general Acts, in any such case the Referees will report that the works cannot be constructed within the powers of the Bill, and that they are, therefore, in an engineering point of view, inefficient.

SECT. I.

NO PROVISION FOR STATIONS, SIDINGS, STANDAGE, ETC.

No provision
for stations.

Thus, it is a fatal engineering objection, that the promoters have not provided for any stations on their line, no powers to use the stations of other companies being taken. In the *North Surrey Railway Bill*, 1865, 110, the promoters proposed a line to run from a junction with the

Balham and Croydon Line of the London, Brighton, and South Coast Railway, near Streatham Station, to a junction with the London, Chatham, and Dover Railway, at Clapham Station. The line would be 2 miles 16 chains long, and would be for 2,090 yards in tunnel or covered way, running under and along the South Road, King's Road, and Loat's Road. The Referees reported, "No land has been provided at either end for stations, nor are any powers taken to run into any stations on any other line, and, in this respect, the engineering details are, in the opinion of the Referees, deficient."

In the *Hornsey and Kingsland Junction Railway Bill*, 1865, 91, the proposed railway was intended to be a double line; and it appeared that no provision had been made either for stations or for the down traffic. The line would effect a junction with the up-line of the Edgware, Highgate, and London Railway, at the east side of the Great Northern Railway, near the Seven Sisters Road Station, where it is only a single line, and no provision was made for the carrying on of the down-traffic, as the down line of the Edgware, Highgate, and London Line was at the west side of the Great Northern Railway. It was also proposed to effect a junction with the North London Railway, but no station was proposed to be erected at such junction, nor were any powers taken by the Bill to run into any station upon the North London Railway. The Referees reported, "For these reasons, the Referees are of opinion that the engineering of this railway is defective." No station.

The *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, was singularly deficient in these respects. Railway No. 9, which was a junction line from Line No. 1, to the North Eastern Railway, near their Wetherby Station, was objected to by that line, upon the grounds that the junction would be effected upon a gradient of 1 in 66, rising towards the North Eastern Railway, without the intervention of any level space upon which a train could stand, and that no powers were taken to run into the Wetherby Station, nor were any sidings provided for stand-No standage for trains.
No powers to use station.
No sidings.

age at this point of junction. The Referees reported, "All the facts were admitted, and the Referees are of opinion that, whilst there are no engineering obstacles to the effecting of a junction as proposed, it is a defect that no standage is provided, nor are powers taken to run into the North Eastern sidings at the Wetherby Station." The North Eastern further objected to a proposed junction of Railway No. 10, with their line in the township of Kirk-Hammetton, upon the same grounds as in the case of Railway No. 9.

Similar objections.

The Referees reported, "The Referees have the same observations to apply thereto, with the addition that there is not any station near the point where the junction is proposed to be effected." The Referees further reported that,

No standage at points of junction.

"The same defect as to the absence of any provision for standage at the several points of junction, applies to the several Railways Nos. 10, 11, 12, 13, 20, and 21, in manner similar to that mentioned in respect of Railway No. 9."

No provision for stations.

The Bill proposed the construction of 21 railways. The Referees thus concluded their report, "It has been admitted that no provision has been made for providing station land or buildings at the termini of said railways, nor at any intermediate points along said lines, nor has any provision been made for sidings at any of the proposed junctions, and the Referees are of opinion that, without those several matters being provided, the intended works will not be efficient for their proposed object."

No provision for stations or sidings.

In the *South Lancashire Railways and Dock Bill*, 1865, 273, the Referees reported that, "no provision has been made for providing station land or buildings, nor has any provision been made for sidings at any of the proposed junctions or at the dock, and the Referees are of opinion that, without those several matters being provided, the intended works would not be efficient for their proposed object."

And in the *Watford and Edgware Junction Railway Bill*, 1866, 90, where the proposed line was intended to pass through, upon the level, a piece of land acquired by the Edgware, Highgate, and London Railway, for the purpose

of constructing their station at Edgware, and that line having opposed, the promoters expressed an intention of making a joint station at Edgware ; but the Referees reported that, "no powers are taken in any Bill to do so."

No provision for Stations on Mineral Lines.—In the following cases, the objection having been taken that no provision had been made for stations, it was held a sufficient answer that the proposed railways were mineral lines only. In the *Ogmore Valley Railway (No. 2) Bill*, 1866, 152, the sufficiency of the estimate was questioned on the ground, *inter alia*, that no provision had been made for stations. The promoters replied, that it was not intended to erect any stations on this line, which was for mineral purposes. The Referees reported that the estimate was sufficient. And in the *Llantrissart and Taff Vale Junction Railway Bill*, 1866, 153, it was objected that no provision had been made in the estimate for stations. As in the last case, the promoters replied, that it was not their intention to erect stations, the line being one for mineral purposes ; and the Referees reported the estimate sufficient.

SECT. II.

NO PHYSICAL JUNCTION EFFECTED WITH ANOTHER LINE WHICH IT IS INTENDED TO JOIN.

In the *King's Lynn Docks and Railway Bill*, 1865, 73, the Bill proposed the construction of a short railway from Fisher's Hut to the Harbour Branch of the Great Eastern Railway at Purfleet. The Referees reported that a junction of the proposed railway with the Harbour Branch could easily be made, in an engineering point of view ; "but," that, "as to whether the promoters take power by their Bill to effect the same, the Referees express no opinion."

In the *Ogmore Valley Railway (No. 2) Bill*, 1866, 152, it was objected that no junction was made between this line and

that proposed by the *Ogmore Valley Railway (No. 1) Bill*. It was shown in reply, "that the two lines would occupy precisely the same ground, with a very slight difference of gradient at one or two points;" and the Referees reported that there was "no engineering difficulty in effecting the junction." And in the *Wrexham and Minera Railway Bill*, 1865, 263, it was objected that, although the line was professedly an extension of the Wrexham and Minera Railway, it had no physical junction with that line. The promoters replied, that though there was no physical junction with the Wrexham and Minera Railway, inasmuch as 12 chains of the Great Western Branch intervened, the Bill authorised the company to enter into arrangements for the user of that line, and the Great Western Railway to subscribe to the undertaking. The Referees reported that there was no engineering objection.

SECT. III.

NO POWERS TAKEN TO ALTER OR AFFECT GRADIENTS OF ROADS AND STREETS.

As to the absence of special powers to alter levels or inclinations of roads and streets, or approaches to bridges. See p. 171.

As to the necessity for special authority in order to effect level crossings, see Railways Clauses Act, 1845, sect. 46, (a) and p. 160, *et seq.*

SECT. IV.

OBJECTION THAT NO RUNNING POWERS TAKEN OVER ANOTHER LINE, IN ORDER TO CONNECT PROPOSED LINE WITH SOME OTHER LINE INTENDED TO BE JOINED.

As one railway cannot lawfully run on the rails of another company without parliamentary sanction, it follows

(a) Railways Clauses (Scotland) Act, 1845, sect. 39.

that if, in order to effect a junction with another line, or with some branch of their own line, it should be necessary for the promoters to pass, even for a few yards only, over the line of some other railway, and no powers are taken by the special Act for that purpose, this will be an engineering objection, because the proposed junction cannot be effected. In the *Bishop's Castle Railway (Extensions to Craven Arms) Bill*, 1865, 194, a junction was proposed to be effected with the main line of the Knighton Railway, at the south end of the platform shed of the Shrewsbury and Hereford Railway, which platform was used by both the Shrewsbury and Hereford and the Knighton Railways for interchange of passenger traffic. If compelled to make the junction at the point shown, the promoters could only reach the platform before-mentioned by running along the main line of the Knighton Railway, and making a back shunt to the platform; and, as they had taken no powers in the Bill to use any portion of the Knighton Railway, but only to use the Shrewsbury and Hereford Station, the Referees reported "that this is an engineering defect, if not remedied." And in the *Manchester, Sheffield, and Lincolnshire Railway (Central Station and Lines) Bill*, 1866, 261 and 297, where it appeared that, by agreement with the Midland Railway, the promoters had arranged that Railway No. 3 should be constructed only up to a certain point from its commencement, and that a junction should there be effected with the authorised Midland Line, the rest of No. 3 being abandoned, the Referees reported that, in an engineering point of view, such junction could be effected; "but no powers are taken in the Bill to run over the portion of the Midland Railway between the point of junction of No. 3 with it, and the junction of the Midland Railway with the promoters' line at Gordon Lane Bridge; and that without such running powers, Railway No. 3 would not be efficient for the object proposed." And see *Wrexham and Minera Railway Bill*, 1865, 263, cited p. 212.

SECT. V.

WHERE CONSTRUCTION OF PROPOSED WORKS CONTINGENT ON
CONSTRUCTION OF SOME OTHER WORKS BEFORE PARLIAMENT,
AND NOT YET SANCTIONED.

In the *Caledonian Railway (Greenock and Gourock Extensions) Bill*, 1866, 109, the Referees reported that, "It is admitted by the promoters that No. 1 Railway was laid out partly for the purpose of obtaining access to a steamboat quay to be erected by the trustees of the harbour of Greenock, and, for the construction of which, powers are sought by a Bill now before Parliament, and that if such powers should not be granted, such access could not be obtained, and said Railway No. 1 would be diminished in length by 900 feet;" and, subject to this and certain other remarks, they reported that the works were efficient. And in the *Greenock and Ayrshire Railway Bill*, 1866, 287, Railway No. 1 was intended to commence by a junction with the promoters' authorised line near Brougham Street, Greenock; and, after passing along a quay proposed to be constructed by the Greenock Harbour Trustees, would terminate in the Clyde, so as to extend the promoters' railway accommodation to the traffic of steamers. The Caledonian Railway objected that the works would be inefficient, "inasmuch as the construction of the quay by the Harbour Trustees had been abandoned for the present Session." The Referees reported "that the construction of the quay being abandoned, the works of Railway No. 1 should be diminished in length by 1,000 feet at its termination in the Clyde."

CHAPTER X.

TUNNELS.

SECT. I.

VENTILATION, GRADIENTS, HEADWAY, DRAINAGE, ETC., OF
TUNNELS.

In the *North Surrey Railway Bill*, 1865, 110, a line was proposed from a junction with the Balham and Croydon line of the London, Brighton, and South Coast Railway, near the Streatham Station, to a junction with the London, Chatham, and Dover Railway at Clapham Station. The line for 2,090 yards would be in tunnel or covered way, running under and along the South Road, King's Road, and Loat's Road, with gradients varying from 1 in 100 to 1 in 130. The Referees reported, that the tunnel in one place could not be at the utmost more than 15 feet high, as no powers had been taken to alter the level of the roads under which it passed, and to lower the level of the rails would make the gradient (there 1 in 100) more steep ; that no ventilating shafts were intended to be made, nor could they be constructed ; and that, considering the length and height of this tunnel, it was very doubtful whether the ventilation in it would be sufficient. They further reported that no land had been provided at either end for stations, nor were any powers taken to run into any station on any other line, and that, in this respect, the engineering details were, in their opinion, deficient.

Tunnel of
2090 yards
under roads.

Headway,
15 feet.

No ventilating
shafts.

In the *London, Chatham, and Dover, and South Eastern (Kennington, Clapham, and Brixton) Railways Bill*, 1866, 163, the petitioners objected that the three tunnels proposed to be made in Railway No. 4, of the respective lengths of 2,083 yards, 930 yards, and 1,293 yards, would be highly defective in an engineering point of view ; that, as to the tunnel of 2,083 yards, the gradients of 1 in 60 for more than half of it, and of 1 in 70 for the remainder, would be objectionable and inconvenient for the heavy trains of the suburban traffic ; that owing to its length and limited headway of 15 feet only, in some places, the ventilation would be deficient, and that the provision made for obviating this objection, namely, by making shafts into the Brixton Road (under which it was intended to make the tunnel), would be inadequate, and objectionable, as obstructing the traffic in the road. That as to the tunnel of 930 yards, the gradient of 1 in 70 for three-quarters of a furlong was also objectionable for the same reason alleged as to the last-mentioned tunnel ; and that as to the tunnel of 1,293 yards, although there was no objection to the gradients, there would be great difficulty in ventilating it, from the absence of the upward draught of an incline, and from the limited headway of a minimum height of 14 feet, and that the difference between the level of the rails and that of the neighbouring sewer would be such as to render the drainage difficult and defective. The promoters replied that there would be no difficulty in working the traffic over the gradients objected to ; that the means they proposed for ventilation would be sufficient, and that, especially as to the tunnel of 2,083 yards under the Brixton Road, the ornamental shafts which (by arrangement with the District and Metropolitan Boards of Works), it was intended should be made, would be adequate for the purpose ; and also, with regard to the tunnel of 1293 yards, that the drainage of the surrounding soil being carried at once to the sewer, the leakage through the brickwork into the tunnel would be all for which they would have to provide permanently, and that this, being gathered by a culvert

Three tunnels,
2083 yards,
930 yards,
1293 yards.

Gradients
objectionable.

Ventilation
deficient.

Gradient.

Ventilation.

Drainage
defective.

laid along the railway, could always be discharged into the neighbouring sewers, except in times of flood, and, that in case of necessity, the company would be ready to provide a steam pump to carry off the surplus drainage. The Referees reported that they were of opinion that the company should undertake to make this provision, and also that the works were efficient for the objects proposed.

SECT. II.

ALLEGED DANGEROUS PROXIMITY OF TWO TUNNELS.

In the *London, Brighton, and South Coast Railway (St. Leonards and Hastings Lines) Bill*, 1866, 254, the South Eastern Railway alleged that the safety of their tunnel, near the St. Leonards Station would be endangered by the construction of an intended tunnel in the close proximity of 50 feet only between the centres of the proposed and existing railways at its commencement. The Referees reported, that it was proved to their satisfaction, "that tunnels in similar positions have been made without injuring existing contiguous works, and that the ordinary precautions in the construction of the proposed tunnel at its commencement would secure the safety of the petitioners' tunnel."

SECT. III.

JUNCTIONS IN TUNNELS.

See *Barnet, Hendon, Hampstead, and London Railway Bill*, 1865, 69 (*ante p. 130*), where such a junction was sanctioned by the Referees.

SECT. IV.

TUNNELS CLOSE TO JUNCTIONS OR TO STATIONS PREVENTING
VIEW OF SIGNALS.

In the *Wolverhampton and Bridgnorth Railway Bill*, 1865, 234 (see fully p. 119), a tunnel of 500 yards in length would intervene between a point of junction and the station, the mouth of such tunnel being 17 chains from the station: sanctioned. In the *Lancashire and Yorkshire Railway (Additional Powers) Bill*, 1865, 239 (see fully p. 114), the proposed Rippenden Branch would enter a tunnel of 530 yards at 14 chains from its junction with the promoters' main line, thus rendering it difficult to see the junction signals: sanctioned. In the *Hadlow Railway Bill*, 1866, 66, (see fully p. 115), a junction was proposed with the Tonbridge Wells Branch of the South Eastern Railway, at a point only $7\frac{1}{2}$ chains from the mouth of a tunnel: sanctioned. In the *London, Worcester, and South Wales Railway Bill*, 1865, 86, (see fully p. 85), an overbridge was proposed over the petitioners' main line, between their Worcester Station and a tunnel of 300 yards, such overbridge being 20 yards from the *north* end of the tunnel, and it was alleged that the said bridge would intercept the view of the signal at the *south* end of the tunnel: sanctioned, repeating signals to be provided.

SECT. V.

TUNNELS UNDER NAVIGABLE RIVERS AND TIDAL WATERS.

See *Birkenhead and Liverpool Railway Bill*, 1865, 285, p. 197; *North Wales and Birkenhead and Liverpool*

Railway Bill, 1866, 106, p. 197 ; Wrexham, Mold, and Connah's Quay and Hoylake Railways Bill, 1866, 107, p. 198.

SECT. VI.

SUBWAY UNDER THAMES FORMED BY SUNK CYLINDERS.

See *Thames Subway Bill, 1866, 429, p. 199.*

SECT. VII.

TUNNEL UNDER CANAL.

See *Brecon and Merthyr Tydfil Junction Railway Bill, 1865, 425, p. 88.*

CHAPTER XI.

DOCK BILLS.

Taking water from the same source as another Dock Company.—Alleged deprivation of supply.—In the *Alexandra (Newport) Docks Bill*, 1865, 292, the Newport Dock Company complained that it was proposed to divert into the proposed docks the waters of the River Ebbw, which would have an injurious effect upon the dock of the petitioners. The point of the river from which such supply would be drawn being lower down than the culverts by which the petitioners derive their supply, the Referees reported that no injurious effect would be produced on the dock of the petitioners.

Construction of Dock narrowing Waterway and increasing velocity of Current. See the *Buckley Railway (Docks, &c.) Bill*, 1866, 105, ante, p. 202.

Interference with Anchorage Ground. See the *Bute Docks, Cardiff (No. 1) Bill*, 1865, 305 (ante, p. 200); *Buckley Railway (Docks, &c.) Bill*, 1866, 105 (ante, p. 202); *Llanelli Railway and Dock Bill*, 1866, 271 (ante, p. 203).

Taking Private Tramways, no objection in an engineering point of view. See the *Hull Docks Bill*, 1866, 91 (ante, p. 97).

Causing Silting up and consequent injury to Channel, &c. See the *Bute Docks, Cardiff (No. 1) Bill*, 1865, 305, p. 201; the *Bute Docks (Cardiff Bill)* 1866, 122, p. 201; and the *Llanelli Railway and Dock Bill*, 1866, 271, p. 203.

Pier Obstructing and Diverting set of the Tide. See the *Llanelli Railway and Dock Bill*, 1866, 271, p. 203.

Docks as designed reported inefficient. In the *Maryport Improvement, Harbour, and Dock Bill*, 1866, 61, it was proposed to construct (among other works) a basin and dock. The Referees reported, in regard to the basin and dock, that the same as designed would not be efficient. (The reasons for this decision are not stated in their report.) The estimate was also reported insufficient.

Dock Company seeking powers to supply Shipping with Water. In the *Bute Docks, Cardiff (No. 2) Bill*, 1865, 313, the undertakers sought powers to supply water to ships using the docks. The Cardiff Waterworks Company alleged that they had always supplied the shipping in these docks with a quantity of pure and wholesome water far exceeding the demand ; and that the Bill would legalise the supply of impure and unwholesome water. It was proved that the petitioners could supply a quantity of pure water to the town of Cardiff and the shipping resorting to the docks, far exceeding any demand which was likely to arise. The mode of supply proposed by the promoters was as follows :—A waterboat would draw water from the feeder flowing from the River Taff into the Bute West Dock, at a point in the said dock a few feet from the entrance of the said feeder into the dock ; and, the water after having been passed through a charcoal filter into tanks in the boat, would then be supplied from the boat to the shipping. The Referees reported “that it is very doubtful whether the water, which cannot be pure when taken into the said boat, is efficiently filtered by its passage through the charcoal filter ; and they are of opinion that, if the water of such feeder from the Taff is to be used, it should be drawn by a service pipe from said feeder at a point near the weir, across the River Taff, and beyond the contaminating influence of the water of the West Dock. The River Taff, from which said feeder is derived, undoubtedly receives the drainage and impurities of a large population ; but it was not proved to the satisfaction of the

Referees that it was rendered so impure or unwholesome as to be unfit for domestic use."

Landing Passengers and Goods by means of a Pontoon. By the *Llanelly Railway and Dock (Extension to Mumbles) Bill*, 1865, 494, a railway was proposed which would run to the Mumbles ; and it was objected that there was no provision for a pier or landing place at the termination of the proposed line. According to the deposited plans the line would terminate at the line of low water of ordinary spring tides ; and it was proposed to dredge at that point to the depth of 12 feet, and to effect the landing of goods and passengers by means of a pontoon to be connected with the end of the proposed line of railway. The Referees reported that there were not any engineering objections to the execution of the proposed works. In the following session an Extension Bill was brought in, the main object of which was the construction of a pier to the Mumbles ;—*Llanelly Railway and Dock Bill*, 1866, 271, p. 203.

Lock at Entrance to Dock too small. In the *South Lancashire Railways and Dock Bill*, 1865, 273, it was objected that the dimensions of the lock at the entrance of the dock, as shown on the deposited plans, were too small for the purposes of the dock ; and to this the promoters replied, that they could construct what was shown in said plans as a tide entrance in the form of a lock of sufficient dimensions (200 feet by 50) by removing the site of the dock 100 feet further back from the river. The Referees reported that the lock as shown was too small ; but that probably the additional accommodation required could be gained by such removal ; and that the same could be effected upon the land contained within the limits of deviation, and possibly at but small additional cost ; but that no plans or sections of the dock works as proposed to be altered had been deposited.

CHAPTER XII.

ESTIMATES.—OBJECTIONS IN RESPECT TO PRICES AND QUANTITIES.

SECT. I.

IMPORTANCE OF ACCURACY IN ESTIMATES, FORM, ETC.

WHEN it is remembered that objections to the estimates of proposed works are of constant occurrence in the Courts of the Referees, and that by Standing Order 96 it is provided that in case the Referees shall report, with reference to any Bill, that the estimate deposited in respect thereof is insufficient, “the Bill shall not be further proceeded with, unless the House shall otherwise order,”—the importance of this subject is at once manifest.

Estimates are made up in a form prescribed by Standing Order 45; which, for convenience of reference, is here inserted :—

“ 45. The estimate for any works proposed to be authorised by any Railway, Dock, or Harbour Bill, shall be in the following form, or as near thereto as circumstances may permit :—

Form of
estimate.

Line, No.	ESTIMATE OF THE PROPOSED			(RAILWAY).	
	Miles.	f.	ch.	Whether Single or Double.	
Length of line .					
Earthworks:					
Cuttings—Rock					
Soft Soil					
Roads					
Total . . .					
Embankment, including roads .					
Bridges—Public Roads . . .					
Accommodation Bridges and Works . . .					
Viaducts					
Culverts and Drains					
Metallings of roads and level crossings . . .					
Gatekeepers' houses at level crossings . . .					
Permanent way, including fencing:					
Miles. fys. chs.					
at					
Permanent way for sidings, and cost of junctions .					
Stations					
Contingencies				per cent.	
Land and Buildings:					
A. R. P.					
Total				£	

The same details for each Branch, and General Summary of Total Cost."

As to the powers of the Referees to enquire into the sufficiency of estimates, see Standing Order No. 92.

Objections to estimates may be classed under two general divisions. (1) Objections to quantities and prices; and (2) objections on account of the omission or under-estimate of claims of compensation.

SECT. II.

OBJECTION THAT QUANTITIES UNDERSTATED.

In the *Maryport Improvement, Harbour, and Dock Bill*, 1866, 61, it was proposed, *inter alia*, to construct a basin and dock and an open breakwater. The Referees reported that the estimate for the same was "insufficient, inasmuch as the quantities, as given in evidence, largely, exceed those upon which the deposited estimate was based." And in the *Craven Junction Railway Bill*, 1866, 110, the promoters proposed to substitute a viaduct for 800 feet of embankment. The Referees reported, *inter alia*, that, as there was a deficiency of 323,083 cubic yards of material for the same, the estimate was insufficient for the construction of the works proposed, even giving credit for the sum of £14,000 taken for the viaduct.

SECT. III.

JUNCTIONS, SIGNALS, SIDINGS, ETC., NOT PROVIDED FOR IN ESTIMATE.

In the *Devon and Somerset Railway (Deviations) Bill*, 1866, 101, the Referees reported that the sum mentioned in the estimate would be insufficient for the execution of the works contained in this Bill, "inasmuch as several necessary works, viz., junctions, signals, and sidings, have been left unprovided for, and the sum provided for other works is also inadequate." In the *London, Chatham, and Dover, and South Eastern (Bromley, Farnborough, and West Wickham) Railways Bill*, 1866, 315, the London, Brighton, and South Coast Railway objected that the estimate was insufficient, in Railway No. 1, for making provision for the

disposal of the spoil or surplus soil, and for the cost of permanent way, for sidings, junctions, and signals ; and, in Railway No. 4, for the sum required for earthwork in cutting, which they alleged was incorrectly calculated in quantity. After hearing evidence adduced by both parties on these points, the Referees reported that the estimate was insufficient.

In the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, however, by which 21 railways were proposed to be constructed, the Referees reported as follows :— “The Referees have carefully examined the estimate, and are of opinion that, with rigid economy, the sum estimated will be sufficient for the execution of the works contemplated in the deposited plans, and perhaps for the carrying such of the roads now proposed to be crossed upon the level over the proposed railways, as may be hereafter required ; but it has been admitted that no provision has been made for providing station land or buildings at the termini of said railways, nor at any intermediate points along said lines, nor has any provision been made for sidings at any of the proposed junctions, and the Referees are of opinion that, without those several matters being provided, the intended works will not be efficient for their proposed object.”

SECT. IV.

OBJECTION THAT NO PROVISION FOR STATIONS, ANSWERED BY FACT THAT LINE FOR MINERAL PURPOSES.

In the *Ogmore Valley Railway (No. 2) Bill*, 1866, 152, the sufficiency of the estimate was questioned on the ground, *inter alia*, that no provision had been made for stations. The promoters replied that it was not intended to erect any stations on this line, which was for mineral purposes. The Referees reported that the estimate was sufficient. And in the *Llantrissart and Taff Vale Junc-*

tion Railway Bill, 1866, 153, a precisely similar objection was taken, to which the same answer was given ; and the Referees reported the estimate sufficient.

SECT. V.

NO PROVISION FOR DEPOSIT OF SURPLUS CUTTING.

In the *North British Railway (Glasgow Branches) Bill*, 1866, 221, the City of Glasgow Union Railway alleged that in the estimated quantity of land required, no provision had been made for the deposit of the large amount of surplus cutting. The promoters stated, in reply, that they had intentionally omitted to make such provision, inasmuch as they would be enabled to dispose of this surplus cutting in the construction of their own adjoining line, the Coatbridge Railway. The Referees reported that the estimate was sufficient. See also the *London, Chatham, and Dover &c. Bill*, referred to *supra*, p. 225.

SECT. VI.

CASES WHERE PROMOTERS CALCULATED ON GETTING RUBBISH GRATUITOUSLY FOR EARTHWORK.

In the *Bute Docks, Cardiff (No. 1) Bill*, 1865, 305, the proposed dock was intended to be formed by embankment, requiring 2,224,712 cubic yards of earthwork. Of this, 300,000 were proposed to be procured by excavation, and the expense thereof was provided for in the estimate ; the remaining 1,944,712 yards were intended to be derived from the ballast discharged from the vessels frequenting the Port of Cardiff, and no sum was provided for obtaining the same, "inasmuch as it is assumed that it would be delivered to the undertakers and laid down where required

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CASES WHERE PROMOTERS CALCULATED ON GETTING RUBBISH GRATUITOUSLY FOR EARTHWORK.

In the *Bute Docks, Cardiff (No. 1) Bill*, 1865, 305, the proposed dock was intended to be formed by embankment, requiring 2,224,712 cubic yards of earthwork. Of this, 300,000 were proposed to be procured by excavation, and the expense thereof was provided for in the estimate ; the remaining 1,944,712 yards were intended to be derived from the ballast discharged from the vessels frequenting the Port of Cardiff, and no sum was provided for obtaining the same, "inasmuch as it is assumed that it would be delivered to the undertakers and laid down where required

by them, free of charge." Upon enquiry as to the amount which might annually be so obtained, the Referees found that it would take a period of seven years for the completion of the proposed works, if no other supply should be obtained; and they reported that the estimate was insufficient. And in the *Greenock Harbour Bill*, 1866, 98, it was proposed to construct a quay or sea-wall to the west of Albert Quay, and in front of the esplanade at Greenock. The Referees reported that the quantity of material for filling up the embankment provided from the sources contained in the estimate would fall short of the quantity required for the purpose by 342,000 cubic yards, even giving credit for 60,000 yards to be derived from the Albert Basin. That an agreement, dated the 8th of March, 1866 (the Referees' report bears date the 14th of the same month), between the trustees of the Port of Greenock and the Board of Police of Greenock of the first part, and the Greenock and Ayrshire Railway of the second part, was offered to show that the said railway company had agreed to fill up, free of expense to the Trustees, the space between the embankment and the esplanade and sea-wall; but that, "inasmuch as the Referees cannot assume that the said railway company is authorised to enter into such an agreement, or has any means of fulfilling the same, the Referees are of opinion that the estimate is insufficient" for executing the said quay or sea-wall.

SECT. VII.

INSUFFICIENCY OF ESTIMATE FOR TUNNEL UNDER RIVER.

In the *North Wales and Birkenhead and Liverpool Railway Bill*, 1866, 106, the company proposed to carry the line under the River Dee, at right angles, by a tunnel of 400 yards long, at a point about half a mile below Ashton Quay, where the waterway is 150 yards wide. The part of the tunnel beneath the bed of the river would be

constructed of brickwork, within a timber coffer-dam, in three successive portions. The bed of sand through which the tunnel would be carried was of so volatile a character, as to render the construction of both the tunnel and the approaches to it exceedingly difficult. The Referees reported that "the calculations on which the estimate was based, while sufficient for works of an ordinary description, are not such as to provide for the effective execution of these works, either in respect of the construction of the tunnel, or the maintenance of the slopes of the approaches to it. The Referees are of opinion that the works above referred to are inefficient, and the estimate insufficient."

SECT. VIII.

NO PROVISION FOR EXPENSE OF DREDGING IN ORDER TO CONSTRUCT HARBOUR OF REFUGE.

In the *Maryport Improvement, Harbour, and Dock Bill*, 1866, 61, it was proposed, *inter alia*, to construct a harbour of refuge of the extent of 60 acres. The Referees reported that it was proved that "the proposed harbour of refuge will not be available (the site of it being a gravel beach, dry at low water) unless it be dredged to a considerable depth, and for that purpose no sum of money is taken by the Bill or included in the estimate."

SECT. IX.

FORESHORE—PROMOTERS ASSUMING SAME TO BELONG TO THEM AND INCLUDING NO SUM THEREFOR IN ESTIMATE.

In the *Bute Docks, Cardiff (No. 1) Bill*, 1865, 305, the proposed works would occupy a portion of the foreshore of Cardiff Flats to the extent of 112 acres. In the estimate

it was assumed that the foreshore was the property of the Marquis of Bute (on whose behalf this Bill was promoted, and who was the proprietor of the adjacent land), and no sum was provided for the acquisition of land. The Referees reported that they "are not in a position to form any opinion as to whether the said foreshore is or is not the property of the Marquis of Bute." (a)

SECT. X.

LARGER AND MORE EXPENSIVE WORKS TO BE CONSTRUCTED THAN SHOWN ON PLANS: BUT ESTIMATE ORIGINALLY PRE- PARED FOR SUCH LARGER WORKS.

In the *Alexandra (Newport) Docks Bill*, 1865, 292, the Referees reported, "It was stated and proved that the docks now proposed to be constructed would be of larger dimensions (viz., the basin or outer dock 650 feet long by 550 feet wide, and the inner dock 2,150 feet long by 550 feet wide) than they are shown to be upon the plan deposited, and the inner dock is intended to be lengthened 50 feet; and, in consequence of those alterations, evidence was given as to the insufficiency of the estimate; but upon careful consideration the Referees are of opinion that the sum estimated will be sufficient for the execution of the proposed enlarged works, which are all within the limits of deviation. It was given in evidence that the estimate lodged was prepared for the enlarged works."

(a) The foreshore of the sea is *prima facie* the property of the Crown. Individuals can have no right thereto, except by express grant from the Crown or by prescription. By one or other of these titles, however, it is not unfrequently vested in the Lord of the adjoining Manor. In the above case the Referees reported the estimate insufficient for other reasons (see p. 227).

SECT. XI.

DIFFERENT MATERIAL TO BE USED FROM THAT CONTEMPLATED IN ESTIMATE.

In the *Connah's Quay Railway and Docks Bill*, 1865, 258, which was a Bill to enable the Wrexham, Mold, and Connah's Quay Railway to extend their line to Connah's Quay, and to construct docks there, the original estimate for the works proposed by the Bill, exclusive of railways, was £275,000; but this included a certain diversion of the course of the River Dee, which had been abandoned, and the cost of which was estimated at £50,647. The estimate for the remaining works was therefore £224,353. The Referees reported, "In the course of the enquiry before the Referees, works were proposed to be executed in material different from that contemplated by the estimate; and it was admitted that the estimates were not made for the execution of the works according to the sections contained in the deposited plans; in fact, the Referees are of opinion that the estimates have been so loosely made, that no reliance could be placed upon them."

SECT. XII.

ROCK CUTTINGS—VAGUE AND UNSATISFACTORY EVIDENCE AS TO SAME—ESTIMATE REPORTED INSUFFICIENT.

In the *Greenock Railway Bill*, 1865, 187, a line of 15 miles in length was proposed from the Albert Harbour to the Glasgow and South Western and Bridge of Weir Railways. In the view of the petitioners, the works could not be executed for less than £381,170, including 10 per cent. for contingencies; while the estimate for the promoters

amounted to no more than £281,890, without any specific allowance for contingencies. The difference between these sums was distributed over various items of expense, and arose in a great measure from the different views entertained as to the nature of the rocks through which the works must be carried. Much of the evidence on either side, on this point, was conjectural. It was stated by one of the promoters' witnesses that trial-borings had been made throughout the line, but no evidence was produced before the Referees on this point. It was, however, stated on the part of the promoters that their estimate was in a great measure founded on the actual cost of a small tunnel and the earthworks and the rock-cuttings on the Wemyss Bay Railway, in course of construction in the immediate neighbourhood. The Referees reported, "The Referees consider that the promoters' estimate is vague and unsatisfactory for works of such an expensive and heavy character. The estimate for rock-cuttings and tunnels seem low, compared with the cost of similar works already constructed on other railways. The margin for contingencies was stated by the promoters to be satisfied by the prices allowed for the works respectively. Taking the cost of land as given in evidence at £62,505, and the rest of the works at £281,000, the estimate being £350,000, the Referees are of opinion that the remaining surplus of £5,605 bears a small proportion to the expenditure on the works sought to be authorised by the Bill."

SECT. XIII.

TAKING SCHEME AS A WHOLE, ESTIMATE SUFFICIENT ; THOUGH
ESTIMATE FOR PARTICULAR PORTIONS OF WORKS INSUF-
FICIENT.

If, for example, the Bill propose to construct several lines forming one scheme, and if the estimate for one of

them (a) prove insufficient, yet if the amount provided for contingencies be large enough to cover the insufficiency, the Referees may treat the whole as one scheme, and report that the estimate, as for the whole intended works, is sufficient. Thus, in the *South Eastern and London, Chatham, and Dover (London, Lewes, and Brighton) Railways Bill*, 1866, 154, it was admitted by the promoters that the slopes for the cuttings and embankments on the Westerham Branch Line must be rendered less steep than proposed ; and that the alteration would involve an additional expense of £5,500, which would render the estimate for this branch, if taken separately, insufficient for the execution of the works. A similar alteration was also admitted to be necessary on No. 4 Junction Line, at an additional cost of £4,000, which would render the estimate for it, if taken separately, insufficient. The Referees' report runs thus :—“The Referees, however, consider that all the lines proposed by this Bill form parts of one whole scheme ; and as the aggregate amount of contingencies (£115,631) is so large, the Referees consider it may be proper to allow part thereof to be applied towards the deficiencies which may occur in the foregoing lines.” In the *Same Bill, ibid*, it was further objected as to Railway No. 4, that there would be a deficiency of 663,000 cubic yards in the material required for the embankments on this line. This was admitted to be true, if this line were taken separately ; but it was a continuous line with Nos. 3 and 5, and it was proved that there would be a surplus of excavation upon those and other adjacent lines belonging to this company sufficient to make up the said deficiency. “The Referees therefore”—as their report bears—“considering those lines as parts of one scheme, are of opinion that sufficient provision has been made for the construction of No. 4 Railway, and that the estimate for the same is sufficient.” The Referees adopted a similar course in the *Brixton, Clapham, and Balham Extension Railway Bill*, 1866, 165, where, it having been ob-

(a) It has been seen that a separate estimate must be made for each, *ante*, p. 224.

jected that the sums taken in the estimate for earthworks was insufficient, the Referees reported that, "taking the railways" (5 in number) "proposed by the Bill as one work, with regard to the cuttings and embankments, the sums taken for earthworks are sufficient." And they again followed the same rule in the *City, Kingston, and Richmond Railway Bill*, 1866, 177. In this Bill the promoters had agreed to carry Railway No. 2 across Fairfield recreation grounds by a viaduct instead of an embankment, as shown on the deposited plans, and that the cutting in which that railway was to be carried across Ham Common should be covered in with slopes at the sides of such covering not exceeding 1 in 20, turfed over. The Referees reported that the first of these alterations would add £2,000, and the latter £10,000 to the cost of construction; and that if they should be required by Parliament, and Line No. 2 were taken as a separate line, the estimate for the same would be insufficient; but that they considered it to be a continuation of Line No. 1, and an integral part of same; that any deficiency which might arise would occur from alteration of the mode of construction proposed in the original estimate, and not from any insufficiency of the estimate to execute the works as proposed; and that the sum provided for contingencies (15 per cent. on both lines) would in their opinion be sufficient to execute the proposed amended works, if required.

SECT. XIV.

PLEA THAT PORTION OF LINE PROVIDED FOR BY ANOTHER BILL BEFORE PARLIAMENT AND BY A SEPARATE ESTIMATE.

In the *Acton and Twickenham Railway Bill*, 1865, 193, the deposited estimate was £120,000. The Referees reported, "It was proved to the satisfaction of the Referees that the works could not be constructed and the land purchased for a less sum than £200,000; and in case of a

culvert being required for drainage of a portion of the line which was carried by a cutting under the Uxbridge Road, a further sum of £3,000 would have to be provided. The insufficiency of the estimate for the whole of the works proposed to be constructed under this Bill was admitted on the part of the promoters ; but it was stated that a portion of the railway, namely, that from Acton to Brentford, was provided for by another Bill now before Parliament ; and that the plans and sections of this portion were deposited in duplicate. It was stated that a separate estimate of £80,000 was deposited for that portion of the line ; and that the estimate of £120,000 was only intended for the remaining works included in the Bill. It does not, however, appear that the deposited estimate for this Bill contained any such limitations as to the works to which it was to be applied. It is described as the estimate of the expense of the undertaking comprised in the Bill, according to the deposited plans and sections ; and, as these plans refer to all the railways described in this Bill, the estimate of £120,000 was wholly insufficient for the construction of the works. If, however, Railway No. 1 is to be considered as provided for by the separate estimate under the other Bill, the Referees are of opinion that the estimate of £120,000 is sufficient for the remaining works.” (a)

(a) The committee on this Bill reported (1865, 271) “that a report from the Referees on Private Bills on the said Bill had been referred to the Committee, and had been considered by them. That it appeared by the said report that the estimate was not sufficient for the proposed undertaking. That, in consequence of the said report, the Committee did not further examine the allegations contained in the preamble of the Bill, and had determined to report that the same had not been proved to their satisfaction.” Later in the session the Bill was recommitted (for what reason does not appear), when the Committee reported “that they had further examined the allegations contained in the preamble of the Bill ; but that the same had not been proved to their satisfaction.”

SECT. XV.

WHETHER NECESSARY TO DEPOSIT ESTIMATE FOR THE EXPENSE OF LAYING DOWN AN ADDITIONAL LINE UPON AN EXISTING LINE.

In the *Swansea Vale Railway Bill*, 1866, 245, power was taken to lay down an additional rail or rails, so as to allow the passage of carriages adapted to the narrow gauge, over a certain part of the South Wales Railway, and the whole of the Swansea Harbour Railway. The cost of laying such rails would amount to £5,250. It was admitted that the expense of laying said rails was not included in the estimate, and that no estimate had been made or deposited for the same, the promoters stating that they were under the impression that an estimate was not necessary. The Referees reported that "if it were necessary that the cost of laying the said rails should be included in the estimate, the deposited estimate is insufficient; but the Referees have every reason to believe that it has not been the practice to deposit an estimate of the expense of laying down an additional rail upon an existing line, and are therefore of opinion that the estimate is sufficient."

SECT. XVI.

HOW ESTIMATE, AS DEPOSITED, DEALT WITH WHERE PORTION OF PROPOSED WORKS ABANDONED.

By the *Glasgow and North Western Railway Bill*, 1865, 369, it was originally proposed to make seven railways of the aggregate length of 33 miles; and the deposited estimate was £300,000. The promoters, however, abandoned 17 miles 62 chains of railway, leaving only 15 miles 18 chains to be constructed. The Referees' report

bears, "the Referees received evidence from the petitioners and the promoters upon the sufficiency of the deposited estimate for the whole works in the Bill, and also of the amount of it to be apportioned to the works which are to be constructed. The estimate of the promoters for these works is £134,290, the original estimate being £300,000, and the sum required for the construction of the works now remaining to be authorised by the Bill being £134,290. The Referees are of opinion that the deposited estimate would have been sufficient, and that the works which have not been abandoned can be constructed at the estimated cost of £134,290." (a)

(a) EXTRACT from the evidence before the Select Committee on the Referees, *vide Report*, p. 20.

"179. Mr. Woodd (to Mr. Hassard). Has it ever occurred to you that parties have, when making their estimate insufficient, proposed to cut off part of the works, so that the estimate should be sufficient? Yes, when presiding over a Committee.

"180. But as Referee? I do not think so in that case; it did occur in a case where a double work was contemplated by the Bill, but in that case there was a portion of the estimate assigned for that work; that work was abandoned; we struck out the correlative part of the estimate, and proceeded upon the part left; we always adopted the practice of striking out an equivalent portion of the estimate.

"181. The case I referred to was that in which the estimate was found to be insufficient, and where they proposed to leave out a part of the work, so that the money should be sufficient for the remainder? (Mr. Adair.) A case occurred before me this session which, in practice, may lead to a disregard of the Standing Orders of Parliament. A Scotch company proposed to construct a certain work, the estimate for which was a certain sum; the company abandoned a considerable portion of their work in deference, as was stated, to the opposition they met with from other companies, and they then came before us with a reduced estimate; we had to consider the whole estimate for the original scheme, and then to subtract, as well as we could, the value of the abandoned part of the scheme, and then to find whether the residuum of the estimate was sufficient for the residuum of the works; but the consequence might have been that the original estimate would have been quite insufficient for the whole scheme, and yet they got through a portion of the scheme by abandoning that for which their whole estimate would not have been sufficient. I only direct the attention of the Committee to that, because it is one of the numerous ways in which great difficulties may arise."

SECT. XVII.

EVIDENCE—PRICE PAID FOR LAND IN THE DISTRICT BY
OTHER COMPANIES, PROVED.

In the *Cannock Chase and Wolverhampton Railway (Hednesford Extension) Bill*, 1866, 118, the petitioners objected that, in the estimate for the proposed railway, the amounts taken for land, &c., was insufficient. The promoters proved that the price for the land "was equal to that given for the purposes of many railways in the district." The Referees reported that the estimate was sufficient.

SECT. XVIII.

EVIDENCE—PRICE PAID FOR SIMILAR WORK IN NEIGHBOURHOOD, PROVED.

In the *Croydon, Mitcham, and Kingston Railway Bill*, 1866, 92, the sufficiency of the estimate having been questioned, the Referees received evidence, "that for similar works now under construction in the same neighbourhood, the prices were less than those contained in the estimate," and that the land generally was of a quality not calculated to command a higher price than that stated in the estimate; and they reported that the estimate was sufficient. See also the *Macclesfield, Knutsford, and Warrington Railway Bill*, 1865, 93, where the sufficiency of the estimate was questioned in regard, *inter alia*, to bridges over public roads. The Referees "received evidence to show that the bridges for public roads were of the same description and price as those built for railways constructed in the neighbouring districts, by the engineer of the company;" and they reported that the estimate was sufficient.

SECT. XIX.

EVIDENCE—INCLINATION OF SLOPES OF EMBANKMENTS OF
NEIGHBOURING RAILWAYS ON SIMILAR SOIL, PROVED.

In the *Pembroke and Tenby Railway Bill*, 1866, 256, which was a Bill to extend the Pembroke and Tenby Railway to Caermarthen and Milford Haven, the Great Western objected that the estimate was insufficient, both for the quantity and price of earthworks and for the bridges, especially the bridge over the River Towy. The promoters contended that the petitioners' objection to the estimate for cuttings resolved itself, as far as quantity was concerned, into the question of the feasibility of the inclination of the slopes and embankments of the railways, which they maintained were similar to those through similar soil in neighbouring railways, and that the sums set down in this respect, and also for the River Towy and other bridges, would be sufficient. The Referees reported that the estimate was sufficient.

SECT. XX.

ESTIMATE REPORTED SUFFICIENT FOR WORKS PROPOSED,
BUT INSUFFICIENT IF BOARD OF TRADE SHOULD ORDER
VIADUCT INSTEAD OF SOLID EMBANKMENT.

In the *Whitehaven and Furness Junction Railway Bill*, 1865, 80, the Furness Railway objected that it was proposed to carry the railway across the Duddon estuary for upwards of $2\frac{3}{4}$ miles upon a solid embankment, with only 350 yards of open viaduct, and that, if so constructed, the effect of the works would be to silt up the sands above the embankment, diminish the area of the tidal basin, and eventually injure materially the Duddon and Barrow

Channels. The Referees reported that the engineering works would be defective, unless the Board of Trade were empowered to require that an open viaduct be substituted for so much of the solid embankment as they might think requisite; and they further reported, "The estimate is sufficient for the works as proposed, and some margin has been provided for contingencies; but if an open viaduct should have to be substituted for a large portion of the embankment, the sum estimated would be insufficient to defray the increased cost."

SECT. XXI.

ESTIMATE REPORTED SUFFICIENT "WITH ECONOMY."

In the *Leeds, Yorkshire, and Durham Railway Bill*, 1865, 219, which was a Bill to authorise the construction of 21 railways, the Referees reported that, having carefully examined the estimate, they were of opinion that, "with rigid economy," the same would be sufficient: and in the *North British Railway (Lasswade, &c., Branches, Bill*, 1865, 174, they reported the estimate sufficient, "if economy be exercised; but very little margin has been provided."

SECT. XXII.

EXPENSE OF SUBSTITUTING OTHER ROADS FOR THOSE TO BE INTERFERED WITH.

By the Railway Clauses Act, 1845, sect. 53-4(a), it is provided that before cutting through, raising, sinking, or using any part of any road, whether carriage road, horse road, tram road, or railway, either public or private, so as to

(a) Similar provisions in Railways Clauses (Scotland) Act, 1845, sects. 46, 47.

render it impassable, the company must cause a sufficient road to be substituted. The expense of compliance with this section must necessarily be considerable where a number of roads are to be interfered with, as in the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 219, in which it was matter of complaint that "the proposed railways will cross 73 public roads on the level."

SECT. XXIII.

EXPENSE OF PROVIDING OTHER GAS AND WATER PIPES BEFORE INTERFERING WITH EXISTING PIPES.

By the 19th section of the Railways Clauses Act, 1845, (a) good and sufficient mains or pipes, syphons, plugs, and all other works necessary or proper for continuing the supply of water or gas, must at the expense of the company have been first laid down in lieu of existing ones, before such existing mains, pipes, &c., can be removed or displaced. The expense which this provision is likely to entail on the company, may no doubt be, in most cases, inconsiderable. But in lines running for any distance in towns, and particularly in metropolitan lines, it may become necessary to scrutinize the estimate in respect to this matter.

(a) Similar provision in Railways Clauses (Scotland) Act, 1845, sect. 19.

CHAPTER XIII.

ESTIMATES.—OBJECTIONS IN RESPECT OF THE OMISSION OR UNDER-ESTIMATE OF CLAIMS OF COMPENSATION.

In a previous chapter on the subject of proposed interference with the private property of individuals, it was pointed out that such interference, though amounting to the total acquisition or destruction of the property, did not constitute any objection to the proposed line in an engineering point of view, but was merely matter for compensation under the Lands Clauses Consolidation Act, 1845. In all cases, therefore, where the property of individuals is proposed to be acquired or “injuriously affected,” the estimate, if not sufficient to cover claims for compensation, is open to objection.

SECT. I.

ESTIMATE INSUFFICIENT, LOOKING TO AMOUNT OF COMPENSATION CLAIMABLE.

In the *East and West Junction Railway Bill*, 1865, 66, the Referees reported, “that upon a careful examination of the estimated and probable cost of the proposed works, and after having examined experienced land and house valuers, on behalf of both promoters and opponents,” they were of opinion that the proposed line could not be constructed for the sum in the estimate, “sufficient provision not having

been made for the purchase of valuable property in the town of Northampton and for contingencies."

In the *Truro Water Bill*, 1866, 94, certain owners and occupiers of mills on the River Allen, alleged that they would be deprived of their supply of water, and no provision was made for a compensation reservoir for their benefit. The promoters stated that they were prepared to make compensation, in water and money, to the petitioners. The Referees reported, that "taking into account the amount of compensation the promoters will be liable to pay, the estimate is insufficient for the objects proposed by the Bill." From a report of the same case, which appears in the 14 *Law Times*, 151, it appears that the opponents having proposed to ask the promoters' engineer what money compensation had been provided for those injuriously affected by the works, no compensation reservoir appearing on the deposited plans, it was objected for the promoters that such an enquiry was beyond the province of the Referees, but the Court held that they had jurisdiction to inquire into and report upon the money compensation.

SECT. II.

WHERE PRIVATE PROPERTY INTERFERED WITH, PETITIONERS SHOULD ATTACK ESTIMATES RATHER THAN ENGINEERING DETAILS.

This follows from the rule already stated. In a number of cases, however, so far as appears, objections were stated to the engineering details only, and not to the estimates. Thus, in the *Leeds, North Yorkshire, and Durham Railway Bill*, 1865, 119, it was objected that the proposed raising of a certain bridge 7 feet for Railway No. 1, would cause the approaches to M.'s land to be more steep, and that Railway No. 1 would destroy a certain plot of land which has been laid out for the erection of mills and wharves.

The Referees reported thus, "The Referees are of opinion that the matters complained of relate to a claim for compensation rather than to an engineering defect, and they do not consider that, so far as this petition is concerned, there are any engineering obstacles to the execution of the proposed railway." And in the *Same Bill*, p. 220, the Referees further reported, "A petition was also presented on behalf of the owners of Ampleforth College, in the county of York, but the subject of their complaint being, in the opinion of the Referees, rather a question of residential damage, the Referees do not offer any opinion thereon." And in the *North of England Union Railway Bill*, 1865, 235, where a petition was presented on behalf of the Keld Head Mining Company, complaining that the proposed railway would pass through the works of the petitioners, take away their water supply, and cut up their dressing floor, the Referees reported, "Evidence was given that the proposed railway passes through the works of the petitioners, causing a very small amount of inconvenience or damage, that it is not intended to interfere with the water supply, and that other dressing floors can be provided upon the premises. The Referees are of opinion that there are not any engineering objections to carrying the said railway through the said works."

In one case, however—the *South Lancashire Railways and Dock Bill*, 1865, 273—the Referees considered the petitioners' objections as of so weighty a nature, that they reported the proposed line defective in an engineering point of view in that respect. The facts were these:—The lessees of the Ince and Hindley Colliery objected that Railway No. 2 would cut off their access to Top Pit, by crossing their tramway leading to the same, and would cut through and destroy a triple set of sidings now used for marshalling their coal waggons, with a cutting of three feet in depth so as to necessitate the alteration of those lines. The promoters stated that those sidings could be re-arranged, but they admitted that they had not made any provision for such re-arrangement, nor had they made any provision in

their estimate for any compensation to the petitioners. The Referees reported, that "the proposed mode of dealing with the tramway to the Top Pit and the marshalling sidings is defective in an engineering point of view." Soon after, a similar question arose in the *Afon Valley Railway Bill*, 1865, 315. Certain petitioners having objected that Railway No. 2 would cross several mineral tramways belonging to them, in such a manner that the levels of the said tramways would require to be altered, in order to give sufficient headway for locomotive engines to pass under them; the promoters admitted that the said tramways had been treated as if they were private roads, and that no specific arrangements had been made for the alteration thereof, neither had any sum been included in the estimate for such alteration. The Referees reported, "The collieries to which the said tramways give access are of considerable value (estimated by the owners as of the value of £50,000), and unless suitable provision be made for working them, a very heavy sum may have to be paid for compensation for damage thereto. But there are no engineering difficulties in the construction of that part of Railway No. 2." They further reported, that "the sum estimated is sufficient for the execution of the works proposed."

SECT. III.

VALUE OF PROPERTY IN TOWNS.—CONTINGENT AND REMOTE INJURY.

The evidence on this subject (as in compensation cases), is often of the most conflicting nature. The two cases which immediately follow will illustrate the wide difference which sometimes appears between the estimate of the promoters' witnesses and that of the witnesses for the petitioners. In the *Belfast New Streets Bill*, 1865, 291, the sufficiency of the deposited estimate, £65,300, was disputed

Two surveyors for the petitioners placed the amount at £115,795, but they stated that they had not taken into consideration any sum to be derived from the resale of such portions of the property taken as were not required for the contemplated works. For the promoters two valuers placed the amount at £64,570 and £59,657 respectively. The Referees reported that the estimate was sufficient. And in the *North London, Highgate, and Alexandra Park Railway Bill*, 1865, 172, the estimate for the railway, which was a line of four miles from the Caledonian Road Station of the North London Railway to the Alexandra Park, was objected to on the ground that the value set down for land to be taken was inadequate. On this point, evidence was given on either side by surveyors and land valuers of great experience in the metropolis, and who were frequently engaged in valuations and purchasing property taken by railway companies. The value of the property to be taken was estimated by the petitioners at the several sums of £180,980 and £176,000. A valuation agreed upon by some of the different surveyors consulted by the promoters, placed it at about £84,400, while the maximum estimate of any surveyor consulted by the promoters was £89,370. The Referees were of opinion that the estimates of the promoters were founded on a more accurate knowledge of the property to be taken, and it, moreover, appeared that in the case of one property, the value of which and the interest belonging to which were much in dispute, it had been valued by a surveyor who had actually arranged with the occupiers, except in one instance; and that generally greater care was taken to ascertain in detail the value of the different premises. The deposited estimate is £290,000, and the estimate of the value of the works agreed upon by both parties was £180,325. There remains £109,672 for the purchase of land to satisfy the promoters' highest estimate of £89,370. The Referees, therefore, are of opinion that the estimate of the promoters is sufficient."

"Faney" value.

In the *Piccadilly and Park Lane New Road Bill*, 1865,

196, the proposed roadway through Hamilton Place to Park Lane would cut off a small portion (about 20 superficial feet), from the garden of house No. 5, and it would intersect and take away a large portion of the garden of house No. 6. According to the arrangement proposed by the promoters, the space taken from the garden of No. 5 would be compensated for by throwing into it a much larger piece of ground (about 1,000 superficial feet), and they considered that by so doing they would indemnify the proprietors, and leave no further claim for compensation in respect of No. 5. The deterioration which would be caused to No. 6 by the loss of garden ground and other injury was estimated by them at £6,600, which their estimate would be just sufficient to cover. According to the valuations of the witnesses for the petitioners, on the other hand, there would be a deterioration in value of No. 5, amounting to £8,000, and of No. 6, amounting to £6,000. The Referees reported, that "The evidence on this part of the case was very conflicting, but it appeared to the Referees that the houses in question, from their peculiar character and the circumstances of their position, possess to a considerable extent what may be called a "fancy" or speculative value, depending on individual taste and sentiment, and, therefore, not capable of being estimated according to a strict standard of market value. Such being the case, the Referees, feeling the difficulty of arriving at a precise conclusion, and of determining beforehand what the value of the property in question may be, in case the proposed roadway should be constructed, are not prepared to pronounce a positive opinion that the estimate of the promoters will prove insufficient for the purpose of the required compensation."

In the *Same Bill*, among the opponents were certain lessees under the crown of houses in Hamilton Place, and in the part of Piccadilly adjoining thereto, which were not actually taken or physically interfered with, but which it was alleged would be injuriously affected and depreciated in value by the conversion of Hamilton Place from a *cul de*

Contingent
and remote
injury.

sac into a public thoroughfare. The Referees reported that this class of petitioners, "in order to make good their claims to compensation, would have to bring their respective cases within the operation of the 68th section of the Lands Clauses Consolidation Act, under the category of lands or houses 'injuriously affected' by the construction of the works. Such cases may involve some important questions of law, and may possibly come under the adjudication of the legal tribunals, and the Referees desire to refrain from giving any opinion as to the validity or invalidity of such claims, but it appears to them that claims of this nature founded upon allegations of contingent and consequential injury, in respect of which the promoters entirely deny their liability, are not such expenses as they (the promoters), are required to provide for in their parliamentary estimate."

SECT. IV.

WHAT IF THE LAND HAS INCREASED IN VALUE SINCE ESTIMATE MADE.

In the *Caledonian Railway (Lanarkshire, &c. Branches) Bill*, 1866, 215, it was admitted by the promoters that the estimate for the land required for Railway No. 10, would be deficient by a sum of about £1,500; "but the land through which the said railway is to run has been feu'd and greatly developed since the making of the survey for the said line, so as to cause a great difference between its present value and the apparent value at the time of the said survey; and in addition to the per-centage (15 per cent. on the works), provided in the estimate for Railway No. 10, a sum of £8,400 was provided for general contingencies which may occur in the execution of all the railways comprised in this Bill. The Referees are of opinion that, under all the circumstances, a portion of the said sum of £8,400 may be

fairly applied to supply the defect on No. 10, and that in such case the estimate for the same will be sufficient."

(See *South Eastern, &c., Bill*, and other cases cited pp. 233—4.)

SECT. V.

WHAT IF NO ACTUAL VALUATION OF LAND, ETC., MADE FOR ESTIMATE.

In the *Huddersfield and Halifax Railway Bill*, 1866, 162, the Referees reported "The estimate is, in the opinion of the Referees, insufficient for the execution of the works proposed ; in fact no actual valuation of the lands required to be taken was made previous to the deposit of the estimate, or until some months afterwards."

SECT. VI.

VALUE OF LAND ON WHICH ANOTHER COMPANY HAVE PARTIALLY CONSTRUCTED WORKS.

In the *Brecon and Merthyr Tydfil Junction Railway (Northern Lines) Bill*, 1866, 223, the Mid Wales Railway objected to the estimates under the following circumstances :—The proposed line between Tal-y-llyn and the Three Cocks Junction would be laid down for its whole length over lands purchased by the petitioners for doubling their line ; and at the stations at Treffieinon and Talgarth it would occupy their second line of rail : the promoters replied that the object of their railway was the doubling of the petitioners' single line of railway, over which they had running powers : the petitioners "also objected to the estimate as insufficient in both the price and quantity of the land, especially with reference to its enhanced value, by reason of the works already executed upon it, the amount of

excavation, and the overbridges." It was admitted by the promoters that they had made their estimate for the land at its agricultural value only. The Referees reported that the estimate was insufficient.

SECT. VII.

WHEN PROMOTERS TAKING PART OF HOUSE, MANUFACTORY, ETC., MAY BE REQUIRED TO TAKE WHOLE.

The Lands Clauses Consolidation Act, 1845 (8 Vict. c. 18), sect. 92 (a) provides,

*No party to
be required to
sell part of a
house, &c.*

"And be it enacted, That no party shall at any time be required to sell or convey to the promoters of the undertaking a part only of any house or other building or manufactory, if such party be willing and able to sell and convey the whole thereof."

In the *Glasgow and South Western Railway (Kilmarnock Direct) Bill*, 1865, 78, it was objected that the estimate was insufficient for that, inasmuch as Railway No. 1 passes over the lands of Mr. Dixon, now occupied as the Govan Ironworks, and which works, with the land, were valued at £350,000, the company could be compelled to purchase the entire of Mr. Dixon's interest in the said works and land." The Referees reported that, "If the company should be compelled so to do, the estimate will be insufficient; but, if not, the Referees are of opinion that the estimate is sufficient for the works proposed. The Govan Ironworks are already divided by a parish road." In the *Buckley Railway (Docks, &c.) Bill*, 1866, 105, the Connah's Quay Chemical Company alleged that the construction of the docks would injuriously affect their property; that by the proximity of the excavation to the foundation of their condenser, the safety of the building would be en-

(a) Similar provision in Lands Clauses (Scotland) Act, sect. 90.

dangered ; that the drainage from their works would be intercepted, their access to the River Dee be stopped, their supply of water from the Wepre Brook be cut off, and the ground on which they deposit the *débris* produced by their manufactory, taken from them. They also objected that the sidings of the railway were inconvenient and objectionable, both owing to their level, which was 3 feet above the floor of their buildings, and because they had been so laid out as to involve the necessity of taking the condenser. The promoters stated that "they expected to carry out their works of excavation without injury to the condenser, but that they were prepared, if necessary, to rebuild it elsewhere on the premises of the petitioners ; that the drainage from the manufactory could be carried by a pipe to the river, and a supply of water by similar means could be obtained from the Wepre Brook for their use ; that access to the dock could be afforded by a siding ; and sufficient land, within the limits of deviation, could be provided for the deposit of the *débris*." The Referees reported that "The estimate is sufficient for the works as proposed, including the removal of the condenser, if necessary ; but that, in the event of the entire chemical works, on which £40,000 have been expended, being taken by the promoters, no provision has been made in the estimate for this purpose. Subject to the foregoing remark, the Referees are of opinion that the estimate is sufficient."

In the *Swansea and Clydach Railway Bill*, 1866, 263, which was a Bill for making a railway from the South Wales Railway near Swansea to Clydach, it was objected that the estimate for land and buildings was insufficient. The Referees reported, "In incorporating 'The Lands Clauses Consolidation Act, 1845,' in their Bill, the promoters propose to omit sect. 92 ; and they admitted that if this omission should not be sanctioned by the Committee on the Bill, their estimate for land and buildings will be insufficient. Subject to this remark, the Referees are of opinion that the estimate is sufficient."

While, however, in all cases where part of a manufactory Promoters may deduct

Proposal to
omit sect. 92
of Lands
Clauses Act.

value of surplus land, &c., where required to take whole.

(as in the *North of England Union Railway Bill*, ante, p. 244), or where part of "Houses"—which term includes gardens attached to houses—(as in the *Piccadilly and Park Lane New Road Bill*, ante, p. 246) is proposed to be taken, it is competent to the opponents to object that sufficient compensation has not been provided in the estimate for the whole property, yet it must be borne in mind that it is competent for the promoters to deduct, from the value of the property as a whole, such sum as the portions thereof not required by them for the purposes of their undertaking, would fetch when resold. The company are required by the 127th section of the Lands Clauses Act, to sell surplus land within ten years after the time limited for the completion of the works, or within such time as may have been prescribed by the special Act for this purpose. In the *North London, Highgate, and Alexandra Park Railway Bill* (1 S. & G. 118), the question first arose, whether the promoters were so entitled to deduct the value of surplus land. The point was specially argued before the Referees, who, after taking time to consider, gave their decision that "the promoters of a Bill are at liberty to include in their estimate the expected proceeds of a resale of land not required for the purposes of the undertaking." The point, therefore, may now be considered as settled. The same practice was followed in the *Belfast New Streets Bill*, 1865, 291, ante, p. 245.

SECT. VIII.

ESTIMATE NEED NOT PROVIDE FOR REMOTE CONTINGENCIES IN THE CONSTRUCTION OF WORKS.

In the *Birkenhead and Liverpool Railway Bill*, 1865, 285, the estimates were alleged to be insufficient; and evidence was given that extraordinary difficulties might be encountered by the meeting with faults and strata charged with water and other serious obstacles in the execution of

the tunnel under the River Mersey.(a) The Referees reported that “ it is possible that such extraordinary difficulties may arise ; but the Referees are of opinion that the occurrence of them will be so uncertain that it would not be just to require the promoters to provide against them in the estimate.”

SECT. IX.

WHEN PROMOTERS MAY BE REQUIRED TO TAKE WHOLE OF INTERSECTED LANDS.

By the Lands Clauses Consolidation Act, 1845,(b) the following provisions are made in regard hereto :—

“ And with respect to small portions of intersected land, be it enacted as follows :

“ 93. If any lands, not being situate in a town or built upon, shall be so cut through and divided by the works as to leave, either on both sides or on one side thereof, a less quantity of land than half a statute acre, and if the owner of such small parcel of land require the promoters of undertaking to purchase the same along with the other land required for the purposes of the special act, the promoters of the undertaking shall purchase the same accordingly, unless the owner thereof have other land adjoining to that so left into which the same can be thrown, so as to be conveniently occupied therewith ; and, if such owner have any other land so adjoining, the promoters of the undertaking shall, if so required by the owner, at their own expense, throw the piece of land so left into such adjoining land, by removing the fences and levelling the sites thereof, and by soiling the same in a sufficient and workmanlike manner.

“ 94. If any such land shall be so cut through and

(a) This tunnel would be for 4,278 yards under the high water mark of the river. See p. 6.

(b) Similar provisions in Lands Clauses (Scotland) Act, 1845, sects. 91, 92.

Intersected lands.
Owners of intersected lands may require promoters to purchase the same,
or to throw into adjoining land.

Promoters may insist on purchase of intersected lands, where expense of bridges, &c. exceeds the value.

divided as to leave on either side of the works a piece of land of less extent than half a statute acre, or of less value than the expense of making a bridge, culvert, or such other communication between the land so divided as the promoters of the undertaking are, under the provisions of this or the special act, or any act incorporated therewith, compellable to make, and if the owner of such lands have not other lands adjoining such piece of land, and require the promoters of the undertaking to make such communication, then the promoters of the undertaking may require such owner to sell to them such piece of land. . . . ”

SECT. X.

COMPENSATION FOR THE TEMPORARY USE OF LAND, ROADS, ETC.

Temporary
use of land.

The temporary use of lands &c., is not unfrequently necessary for the construction of the proposed line and works. The estimate should be sufficient to cover claims for compensation in respect of such temporary use. The enactments on this subject are contained in the Railways Clauses Act, 1845 (*a*). Section 30 provides that the company may occupy temporarily private roads within 500 yards of the railway, paying compensation to the owners and occupiers. By section 32 the company may take temporary possession of land for the purposes of taking earth or soil by side cuttings therefrom ; or of depositing soil thereon ; or of obtaining materials therefrom for the construction or repair of the railway and accommodation works ; or of forming roads thereon. By section 42, owners of lands so temporarily occupied may compel the company to purchase the said lands. Section 43 provides that where the company shall not be required to purchase such lands, they

Company
may be
compelled to
purchase.

(*a*) Similar provisions in Railways Clauses (Scotland) Act, 1845, sect. 25, *et seq.*

are to make compensation for such temporary occupation, to pay rent and pay the full value of all clay, stone, gravel, sand, and other things taken from such lands.

SECT. XI.

ACCOMMODATION WORKS.

As to the works which it is necessary to provide for the accommodation of proprietors and tenants through whose lands the line passes, see p. 102.

In the *Macclesfield, Knutsford, and Warrington Railway Bill*, 1866, 93, the estimate was objected to as being insufficient for the execution of accommodation and other works. As to the accommodation works, the promoters adduced evidence to show that the reason why they had not included the usual amount per mile for such works, other than those specified on the plans and sections, "was because by communication with the greater part of the owners and occupiers, they had already ascertained and provided for their actual requirements in this respect." The Referees reported the estimate sufficient.

In the *Halesowen and Bromsgrove Railway Bill*, 1866, 235, the estimate was alleged to be "insufficient for accommodation bridges and works, culverts, drains, and river bridge, and for land and buildings." It was shown that the sum set down in these respects in the estimate for Railway No. 1, and especially for the severance of land and buildings (for which no provision appeared to have been made), would be inadequate. The Referees reported the estimate for No. 1 was insufficient.

CHAPTER XIV.

ESTIMATES.—FOR WHAT COMPENSATION IS CLAIMABLE.

SECT. I.

THE SUBJECT GENERALLY.

The Referees having no power to adjudicate on points of law, it is, of course, not within their province to decide whether particular petitioners are entitled to compensation under the Lands Clauses Act, or whether in consequence they are entitled to challenge the estimates on the ground that such compensation has not been provided for in the estimate. In the *Piccadilly and Park Lane New Road Bill*, 1865, 196, for example, where the promoters disputed whether the lands, &c., of certain petitioners were "injuriously affected" within the meaning of the 68th section, the Referees reported "that such cases might involve some important questions of law, and may possibly come under the adjudication of the legal tribunals. The Referees desired to refrain from giving any opinion as to the validity or invalidity of such claims; but it appears clear to them that claims of this nature, founded upon contingent and consequential injury, in respect of which the promoters entirely deny their liability, are not such expenses as they (the promoters) are required to provide for in their parliamentary estimate."

In cases, however, where from decisions of the courts of law it appears that the petitioners are so "injuriously affected" as to be undoubtedly entitled to compensation, it is apprehended that the Referees will take judicial notice of such decisions, and will act on them.

There are two distinct classes of cases in which compensation must be paid by the company, (1) where land, &c. is actually taken, and (2) where land, &c. is "injuriously affected," although not actually taken. In the first case, by section 63 of the Lands Clauses Act, the purchase money or compensation shall include the damage caused by severance or by "injuriously affecting" other lands adjoining. Difficult questions, however, have arisen as to when lands, &c. are to be considered as "injuriously affected." In *Chamberlain v. West End of London and Crystal Palace Railway Company*, 31, L. J. Q. B. 201, it was observed by COCK-BURN, C. J., "The test now laid down in this Court and which appears to me to be the true one, is, whether an action would have lain for the injury but for the statute authorising the formation of the railway; and if it would, then the land is injuriously affected, and compensation may be required and awarded."

The various decisions on this subject are, in this chapter, collected and arranged for convenient reference in the Court Rooms of the Referees.

Meaning of
"injuriously
affected."

SECT. II.

COMPENSATION CONSEQUENT ON INTERFERENCE WITH ROADS AND STREETS.

Where the plaintiff possessed a cottage and a small piece of land on a level with and abutting on a public high road, from which a short way or passage over the plaintiff's land afforded access to his cottage; and a railway company, in the execution of the works of their railway, lowered the public high road 7 feet, leaving the plaintiff's land and

Lowering road
past cottage
7 feet.

Leaving cottage on edge of precipice.

cottage on the edge of a precipice of that height, and thereby obliging the plaintiff to make use of a step-ladder in order to obtain access from the public high road to the way or passage leading over his land to his cottage ; it was decided that in such a case compensation was claimable (*Moore v. The Great Southern and Western (of Ireland) Railway Company*, 10 Ir. Com. Law Rep. 46 ; see also *R. v. Eastern Counties Railway Company*, 2 Q. B. 347 ; 2 Rail. Cases, 736).

Raising road past house 10 feet.

Where the plaintiff possessed a dwelling-house abutting on a public high road, and a railway company, in the execution of their works, raised the public high road to the height of 10 feet opposite to the plaintiff's house, so that the access to the house was thus impeded, and the house was rendered damp and unwholesome by rain and mud which penetrated into it from an adjoining bridge, whereby the plaintiff lost his health, it was held that the railway were liable in compensation (*Tuohey v. The Great Southern and Western Railway Company (of Ireland)*, 10 Ir. Com. Law Rep. 98).

House rendered damp, &c.

Where the plaintiff was owner of land appertaining to which was a right of way over a private road on the land of third persons, and a railway company, under the provisions of their Act, constructed a railway crossing the road on the level, and erected gates on the road at each side of the line, which were kept locked, under the provisions of the Act, the servant of the company keeping a key, and the plaintiff also having a key, the Court held that the plaintiff's land was "injuriously affected" within the meaning of the Consolidation Acts (*Glover v. The North Staffordshire Railway Company*, 16 Q. B. N. S. 912).

Crossing on level *public* road forming access to house.

But the case is otherwise where the road crossed is a *public* road, for then a level crossing is a grievance to be endured without complaint by private persons from a consideration of the benefit gained by the public. Hence, where a railway passed within a few yards of a gentleman's lodge, across a public road forming the chief access to his residence, although he was liable to constant stoppages by

the closing of the gates on the level crossing, and other inconvenience, it was held by the House of Lords (reversing the decision of the Court of Session in Scotland) that the railway company were not liable to pay compensation (*Caledonian Railway Company v. Ogilvy*, 2 Macqueen's H. of L. Rep. 229). This principle was acted on in the case of *Wood v. The Stourbridge Railway Company*, 16 C. B. N. S. 222.

In this case it was also decided that one who sustains a private and particular injury from the diversion or obstruction of a public road by the works of a railway company, which diversion or obstruction, if done without the sanction of an Act of Parliament, would give a right of action, is entitled to compensation, although if the inconvenience or annoyance sustained is such only as is common to all the Queen's subjects, no action would lie, and therefore that where the plaintiffs enjoyed access to their works by a certain road which the company had stopped up, they were entitled to compensation.

It has been held that if a railway company, in constructing their railway, block up a thoroughfare leading to a shop, so as to occasion loss to the shopkeeper in his business, by preventing the passing of customers to his shop, *the loss of business* is not the subject of compensation. Therefore, where a railway company, in the execution of authorised works, interfered with and obstructed a highway leading to a public-house of which the plaintiff was lessee, thereby causing such a diminution in the number of the plaintiff's customers as to cause to him in his business as a licensed victualler, damage to the extent of £100, it was held, in the Exchequer Chamber (two learned judges dissenting) that as a claimant's title to compensation, under the 68th section of the Lands Clauses Act, is only in respect of land, or an interest therein which has been "injuriously affected," this damage did not accrue to the plaintiff in his capacity of owner of an estate in land, for that the *house* was not injuriously affected by the profits of the plaintiff's trade carried on therein being diminished by the obstruction (*Ricket v. The Metropolitan Railway*

No compen-
sation.

Secus where a
"private and
particular in-
jury" sus-
tained.

Obstruction
of street.

No compen-
sation for
consequent
diminution of
business of
public-house.

Company, 5 B. & Sm. 149. A contrary doctrine had previously prevailed on this subject: see the earlier cases of *Senior v. The Metropolitan Railway Company*, 32 L. J. Ex. 225, and *Cameron v. Charing Cross Railway Company*, 16 C. B. N. S. 430, reversed 13 W. R. 390.

But where by diversion of street, value of houses as residences lessened.

The following case must, however, be distinguished from that of *Ricket*. A railway company, under the powers of their Act, took, for the purposes of their railway, a portion of a highway, and constructed a railway across it, and a deviation road and bridge over the railway. Plaintiff alleged that by the said highway being wholly blocked up, the company had "injuriously affected" certain houses of which the plaintiff was lessee, being four houses on the highway, and eight other houses which, at the time of the execution of the works, were in the course of erection for the purpose of being used as dwelling-houses, fronting a new road running at right angles to the highway, and that by reason of the obstruction of the highway, through the construction of the railway across the same, the access to the houses of the plaintiff was, notwithstanding the substitution of the deviation road, rendered less convenient for the occupiers; and many persons would be prevented from passing the same, and the houses had thereby been rendered less suitable for being used and occupied as shops, and the value of the houses had been greatly diminished. On demurrer it was held by the Court of Queen's Bench, and affirmed in the Exchequer Chamber, that the houses of the plaintiff were "injuriously affected," and that therefore the plaintiff was entitled to compensation (*Chamberlain v. The West End of London and Crystal Palace Railway Company*, 2 Best & Smith, 605). The principle on which this case was decided was, that the compensation was claimed, not as for loss of profits, but for the depreciation in value of the houses. In commenting on this case, in the course of his judgment in *Ricket v. The Metropolitan Railway Company*, ERLE, C. J., observed, "The principle is that the value of a house is affected by the relation of its situation to the adjoining highway; that is, by the conveni-

ence of the private rights of ingress and egress from the one to the other, and by the circumstances of the highway itself tending to make it useful and agreeable to the occupier of the house. If a house on a level with a commodious, beautiful, and well-frequented street, be either lifted or sunk by the railway 20 feet above or below the level of that street, the house would be injuriously affected, both for pleasure and profit, by reason of the change in the access to and from the house ; or if a house fronting to a street of that description should be turned round so as to front to a dark back alley, the house would be injuriously affected. The site of the house would be altered for the worse. In these cases here suggested, the house is supposed to be removed, to make the meaning more clear ; but if, instead of lifting or sinking the house, or turning its front from a grand street to a back alley, the street is lifted or sunk or changed in its character, the relation of the house to its highway is affected precisely to the same degree as it would be by altering the relative position of the house itself in respect of that highway. Such is the principle of *Chamberlain v. The West End of London and Crystal Palace Railway Company*. The frontage had been to a wide well-frequented road leading direct to and from important towns ; by the execution of the railway works, it was made to front to a dumb alley sunk below the level of the substituted thoroughfare over a railway bridge, along which the stream of passengers would be compelled to flow."

In accordance with the principle laid down in *Ricket v. The Metropolitan Railway Company*, it was decided that where the Metropolitan Board of Works, in exercise of the powers conferred on them by their Act, and for the purpose of enabling them to reconstruct a sewer running under a street, erected a hoarding in such street, which rendered the access to the plaintiff's livery stables less convenient than it had been before, but no part of such premises were taken, nor did it appear that the hoarding was kept up beyond a reasonable time, it was held that the plaintiff was

Hoarding
erected in
street.
Obstructing
access to
stables.

not entitled to compensation for the damage he had sustained by the erection of such hoarding (*Herring v. The Metropolitan Board of Works*, 34 L. J., Mag. Ca. 224).

Loss of business where premises taken.

But where the premises in which a business is carried on are actually taken, compensation may properly be claimed for the loss of business. Thus, in *Jubb v. The Hull Dock Company*, 9 Q. B., 443, where a brewery had been taken by the defendants, and the plaintiff claimed to be compensated for the loss he would sustain by having to give up his business as a brewer until he could obtain other suitable premises for carrying it on, the Court held he was so entitled.

Destruction of houses, &c., near public-house.

The destruction of houses and public roads in the neighbourhood of a public house, by which the custom of the house was diminished, is not matter for compensation (*Rex v. London Dock Company*, 5 Ad. & Ellis, 163).

SECT. III.

COMPENSATION CONSEQUENT ON INTERFERENCE WITH WATER.

Diverting stream.

In *Ferrand v. The Corporation of Bradford*, 21 Beavan, 412, it was decided that the diversion of a stream is a "taking and using it" within the meaning of the Lands Clauses Act (which is incorporated in the Waterworks Clauses Act), and that the owners and occupiers of the land through which the stream passed were entitled to compensation.

Diverting water from tan-yard.

In *Mortimer v. The South Wales Railway Company*, 1 E. & E. 375, the plaintiffs were lessees of a tan-yard, and enjoyed the flow of certain water into the same; and the defendants, under their Act, partially diverted the water and deprived the plaintiffs of the benefit thereof, the plaintiffs claimed and obtained compensation on the ground that their tan-yard and premises were "injuriously affected."

In *Ware v. Regent's Canal Company*, 3 De G. & J. 212, it was held that an occasional flooding of lands, caused by works properly executed by the defendants within their parliamentary powers, was within the 68th section of the Lands Clauses Act, and was, therefore, the subject of compensation.

Occasional flooding of lands through construction of works.

Where the plaintiff was owner of a farm, and employed a stream, which flowed through the same, for the purposes of irrigation and the use of his cattle, and the defendants, having taken part of the said farm, cut off and diverted the said stream to the plaintiff's loss, it was held that was a case for compensation (*Little v. The Dublin and Drogheda Railway Company* 7 Ir. Law Rep. 82).

Diverting stream used for irrigating farm, and for cattle.

Where the working of a mill was impeded and its value became lessened by the removal of a certain weir by the company, they were held liable in compensation (*R. v. Nottingham Old Waterworks Company*, 6 A. & E. 356).

Impeding working of mill by removing weir.

In *Bell v. The Hull, &c., Railway Company*, 6 M. & W. 699, the plaintiff had a wharf on the River Humber, between which and the low water mark the defendants constructed their railway, thereby rendering the communication between the wharf and the river inconvenient and dangerous, it was held that the plaintiff's wharf was "injured" within the meaning of the provisions in the defendants' special Act. See also, on this point, *Macey v. The Metropolitan Board of Works*, 33 L. J., Ch. 377, which was a case under the Thames Embankment Act, 1862.

Interfering with communication between wharf and river.

In the *Queen v. The Great Northern Railway Company*, 14 Q. B., 25, where the claimant enjoyed a certain ancient ferry across a river as appurtenant to his houses and premises on the east bank, and had always kept a ferry boat and taken toll from passengers, and the company, by constructing their line along the opposite bank of the river, obstructed the access to the river on that side, it was not disputed that the claimant's property was "injuriously affected," and that he was entitled to compensation, the question before the court being in regard to the local jurisdiction only.

Obstructing access to plaintiff's ferry.

Raising level of brook, and thereby causing coal mine to be inundated.

In *R. v. North Midland Railway Company*, 2 Railway Cases 1, the defendants (under an Act which gave power to divert rivers, &c.), had raised the level of a brook, into which the sough of a coal mine had been accustomed to empty itself, and thereby caused the water of the brook to flow into the sough and inundate and stop the coal works, the owner of the works obtained a mandamus for a jury to ascertain and compensate him for the injury done, although the defendants had restored the brook to its former level.

Diverting channel of river, and so destroying profit of towing path.

In *R. v. The Commissioners of the Navigation of the Thames and Isis*, 5 A. & E. 804, it appeared that the claimant possessed an ancient towing-path on a part of the river, and the exclusive right of towing barges on that part, taking tolls for so doing ; that the defendants made a "cut" in the river, by which barges were enabled to avoid that part of the river, and dispense with the use of the claimant's horses, and so avoid the payment of the tolls, and that by diverting the old channel of the river they had made the towing path wholly unprofitable ; the claimant was held entitled to compensation.

Subterraneous water.

Drawing off water from a well.

In *The New River Company v. Johnson*, 29 L. J., Mag. Ca. 93, in the execution of certain works authorised by the Waterworks Clauses Act, 1847, incorporated with their special Act, the company intercepted water which would otherwise have percolated through the strata of earth into a well upon the premises of the claimant, and drained off water which had accumulated in the well. It was held, that inasmuch as no action would lie against the company (*a*), in respect of either quantity of water, supposing no Act authorising the execution of the works had been passed, a claim for compensation could not be sustained.

(*a*) In *Chasemore v. Richards*, 29 L. J. Exch. 81, it was decided that the owner of an ancient water-mill on a river has no right of action against an owner of land adjacent, who digs a deep well on his land, and thereby diverts the underground waters, not known to be formed into a stream flowing in a defined channel, which otherwise would have percolated into the river, although the landowner does not use the water for purposes connected with his land, but pumps it up, and carries it off in pipes, to supply persons resident in the neighbourhood, many of whom had no right as owners to the use of the waters at all.

And in *Galgay v. The Great Southern and Western Railway Company*, 4 Irish Law Rep. 456, where the defendants had constructed a tunnel under their own land, and thereby diverted the subterranean water from plaintiff's land contiguous to the tunnel, it was held that the defendants were not liable for the diversion of this underground water. See also *The Queen v. The Metropolitan Board of Works*, 3 Best & Sm. 710, where it was held that, independently of the special provisions of the defendants' Act, the owner of an estate was not entitled to compensation, in respect that the defendants, by the construction of a certain sewer, intercepted springs which would otherwise have risen to the surface and flowed into the claimant's pond.

Tunnel diverting subterranean water.

In a case decided in 1810, *R. v. the Bristol Dock Company*, 12 East, 429, the defendants being bound under their Act, to make compensation for injury &c., it was decided that no compensation was due to the owners of a brewery for a loss arising to them in their business from the deterioration of the water of the public river Avon, from which the brewery had been before supplied by means of pipes laid under low-water mark ; the use of the water having been common to all the King's subjects, and not claimed as an easement to the particular tenement.

Water of river polluted and rendered unfit for brewing.

SECT. IV.

COMPENSATION IN RESPECT OF VIBRATION, NOISE, ETC.

In regard to compensation for vibration caused by the passing of trains, the law stands thus :—In estimating the compensation to be paid to an owner for part of his property taken, the damage likely to arise through vibration to the rest of his property, may legitimately be taken into account ; as, for instance, where the company tunnel under a house. See *Croft v. London and North Western Railway Company*, 3 Best & Sm. 436, and 32 L. J. Q. B. 113.

But where no part of the property alleged to be injured by vibration has been taken by the company, and compensation is claimed in respect of vibration only, the claim cannot be sustained. Thus, in *Penny v. South Eastern Railway Company*, 7 E. & B. 660, the plaintiff alleged deterioration in the value of his property "from the close approximation of the railway to the property, and the constant noise and shaking and annoyance by day and night caused by the passage of the trains, particularly the special luggage and ballast trains, and by or from the circumstance of the back windows and gardens being overlooked by the passengers on the railway and railway platform, and by the servants and workmen employed by the company, and the privacy of the plaintiff and his family, and of his tenants being thereby invaded and disturbed ; and also by the effluvium arising from the waste water which is frequently let out of the engines or boilers on the trains staying to take up and set down passengers at the railway station." The Court held that no compensation could be claimed. In the more recent case of *Brand v. the Hammersmith and City Railway Company*, 1 Law Reports, C. L. 130, it was held that the owner of a house, none of whose lands had been taken for the purposes of the railway, could not recover compensation in respect of injury to the house, depreciating its value, caused by vibration, smoke, and noise in running locomotives with trains in the ordinary manner, after the construction of the railway. It is settled, however, by both these cases, that compensation may be claimed for such injury arising *during the construction* of the works. See particularly the judgment of MELLOR, J., in the latter case.

SECT. V.

COMPENSATION FOR DANGER TO COTTON MILL THROUGH
PROXIMITY OF RAILWAY.

Although it is an undoubted general rule that compensation for injury caused by the works of a railway company can only be claimed where, but for the authority of the special Act, an action would have lain; yet this rule does not extend to the case of a party seeking compensation for injury resulting to a portion of his lands by reason of acts done on another portion of them which has been taken from him for the purposes of the railway. Where, therefore, a railway company took some land of L. under their Act, and proposed to make their railway on it, so close to a cotton-mill belonging to him that, by reason of the proximity of the railway and the danger of fire from the trains using the line, the building was less suitable for a cotton-mill, and could only be insured at an increased premium, and was rendered of less saleable value, it was held that L. was entitled to compensation in respect of the mill being so "injurious affected." *In re the Stockport, Timperley, and Altringham Railway Company*, 33 L. J. Q. B. 251; reported as *R. v. The Clerk of the Peace of Cheshire* in 4 New Rep. 167.

SECT. VI.

COMPANY TAKING PART OF HOUSE, MANUFACTORY, ETC., MAY
BE COMPELLED TO TAKE WHOLE.

It is enacted by the 92nd section of the Lands Clauses Act, (a) that "No party shall at any time be required to

(a) Similar provision in Lands Clauses (Scotland) Act, 1845, sect. 90.

sell or convey to the promoters of the undertaking a part only of any house or other building or manufactory, if such party be willing and able to sell and convey the whole thereof."

The word "house" in this section has been held to comprise all that would pass by the grant of a messuage, which includes not only the curtilage but also the garden, and all that is necessary to the enjoyment of the house, if within one ambit, whether attached to the main building or not, and though purchased subsequently to the erection of the main building. *The Governors of St. Thomas's Hospital v. The Charing Cross Railway Company*, 30 L. J. Chan. 395. In this case the company proposed to take only a small portion of the hospital precincts, the proposed line passing over a corner of the inclosed garden ground to the north wing of the hospital, the centre line of railway being 23 feet from the northwest corner of the wing. The company having been required to take the whole hospital under section 92, were held bound to do so.

Case of St.
Thomas's
Hospital.

The St.
Pancras Alms-
house case.

In the St. Pancras Almshouses case the trustees, having acquired land for the purpose, had erected a building, intending to complete the same by the erection of a wing on either side when they should have funds sufficient for the purpose. The company gave notice of their intention to take part of the land on which one of the wings would be erected according to the plan. It was held that, although the company did not propose to touch the actual building, they would be taking part of a "house." *Grosvenor v. The Hampstead Junction Railway Company*, 26 L. J. Chan. 731. In the course of his judgment in this case, Vice-Chancellor Wood cited an unreported case, *Dakin v. The North Western Railway Company*, in which it was proposed to take the privy which accommodated a house, and which was in a corner of the curtilage quite separate from the house, and the Court decided that this was taking "part of a house."

Taking part of
workshop.

Part only of a workshop cannot be taken, where the owner gives the necessary counter-notice to take the whole.

Giles v. The London, Chatham, and Dover Railway Company, 30 L. J. Chan. 603.

Where the company proposed taking a part of the garden attached to a dwelling house, thereby cutting off the end of the garden and summer house, it was held that they were bound to take the whole property. *Cole v. The West of London and Crystal Palace Railway Company*, 27 Beavan, 242.

Where a property consisted of a house and stables, &c. with a garden, pleasure grounds, and orchard, standing on $1\frac{1}{4}$ acres of ground, and a railway company proposed to take part of the orchard and a corner of the garden, it was held that they were bound to take the whole. *King v. The Wycombe Railway Company*, 28 Beavan, 104.

Where the plaintiff had erected and covered in three new houses, but while they were in an unfinished state a railway company required a portion of the land which was intended to be attached to them as gardens, the Court held that the company was bound to purchase the whole of the property, although the houses had never been completed, and had fallen into a state of great dilapidation. *Alexander v. The Crystal Palace Railway Company*, 30 Beavan, 556.

Where a house had attached to it a shrubbery and a series of gardens separated by walls, but all connected by a gravel walk passing through the dividing walls, it was held that the garden furthest from the house, and inclosed at a more recent period than the others, was part of the "house" within the meaning of the Act. *Hewson v. The London and South Western Railway Company*, 8 W. R. 467.

The word "house" in the 92nd section is to be read in its ordinary and legal sense, and not in a more limited sense than that in which the law generally, if not universally, understands it (per Lord Justice KNIGHT BRUCE, in *Grosvenor's Case, supra*) ; and, therefore, whenever doubt arises as to whether a particular piece of land, &c., forms part of the "house," the test to be applied is, whether the same would pass as part of the appurtenances in a conveyance of the house (per the MASTER OF THE ROLLS, in *Ferguson v.*

Taking part of
garden
attached to
house.

Taking
orchard
attached to
house.

Taking land
intended for
garden.

Taking fur-
thest of a
series of gar-
dens.

Test to be
applied as to
meaning of
"house."

The London, Brighton, and South Coast Railway Company, 2 New Rep. 504).

Cases where Company held not bound to take whole.—The following cases were held to be not within the meaning of the 92nd section, and the company where held not bound to take the whole:—Where the lessee of a house acquired the right to obtain at a future time a lease of land in the rear of his house, with the view of extending his garden, and before the time arrived, the company served him with a notice for part of this land, it was held that the land, not being at the time when notice was served, nor having been previously, appurtenant to the house, did not form part of the “house” (*Chambers v. London, Chatham, and Dover Railway Company*, 1 N. R. 517).

And where a field in front of a house was used by the inmates as a meadow and cricket-ground, but was separated from the house and garden by a public road, a company proposing to take the field were held not bound to take the house and garden also; and the court held that it made no difference that the field and house were included in the same demise to the lessee and occupier (*Fergusson v. The London, Brighton, and South Coast Railway Company*, 2 New Rep. 503, and 33 Beavan, 103).

In *Steele v. The Midland Railway Company*, 1 Law Rep. C. L. 275, the plaintiff was owner and occupier of a house and 6 acres of meadow land on the west of the Edgware Road. He had a large family, and, the ground he had being insufficient for the horses and cows which he kept for their use, he bought $6\frac{1}{4}$ acres on the other side of the road, the nearest point being distant 120 yards from his entrance-gate. At the nearest point of this land were a cow-house, loose-box, and a cottage, which was occupied by his grooms, because he had no accommodation for them on his own side of the road, and he, for a number of years, occupied the land for the purpose of feeding the horses and cows requisite for his establishment. It was decided that the $6\frac{1}{4}$ acres could not be considered part of the “house.”

Where a field occupied with a house was separated from

Taking land
to which
plaintiff has
a prospective
right.

Taking field
separated by
public road
from house.

Taking land
separated by
public road
from house.

Taking field

the gardens by a sunk fence, crossed by two ornamental bridges, and a gravel walk under a row of trees led across the field to a cottage occupied by the owner's coachman, and to a gate leading into a public road, and one or two cows were kept in the field, and the field was also used for various out-door amusements, it was held that it was not part of the "house" (*Pulling v. The London, Chatham, and Dover Railway Company*, 4 New Reports, 386).

In *Reddin v. The Metropolitan Board of Works*, 10 W. R. 764, it was decided that the business of dust contractor is not a manufacture, and that a detached "tottishop," where the dust and rubbish were collected and sorted, was not incident to or a part of a manufactory, although, in other parts of the business premises, some of the materials thus sorted were subjected to manufacturing processes. But in *Sparrow v. The Oxford, Worcester, &c., Railway Company*, 2 D. M. & G. 94, the land proposed to be taken by the defendants was included within the same walk with certain tin-plate works, and was used for the deposit of ashes from the works; and it was held to be part of the manufactory.

As to tunnelling under, or throwing an arch over, part of a manufactory, see *infra*.

separated from
gardens by
sunk fence.

Business of
a dust-con-
tractor not a
"manufac-
ture."

Land for de-
posit of ashes
at tinplate
works.

SECT. VII.

WHETHER A COMPANY TUNNELLING UNDER MAY BE COMPELLED TO TAKE THE WHOLE LAND AND BUILDINGS ON THE SURFACE.

The question whether a company proposing to tunnel under land may be compelled, under the 92nd section of the Lands Clauses Act, to take the surface also, and all buildings, &c., that may be upon the surface, has not at all times been free from doubt. In *Ramsden v. Manchester, &c., Railway Company*, 1 Exch. 723, the defendants

having made a tunnel under a certain public road without having paid compensation before entry, as required by the Lands Clauses Act, the plaintiff brought an action of trespass, alleging that he was entitled to the close for a term of 999 years, subject to the public right of way over the same. It was held that the plaintiff being entitled to compensation for the permanent occupation of his land, and the defendants having entered on the land without having first paid compensation, they were guilty of the trespass, and judgment went for the plaintiff. Although this case has been sometimes cited as an authority for saying that a company tunnelling may be compelled to take the surface as well, yet this was not the real point decided, which was simply that compensation was payable and ought to have been paid *before entry*. In *Sparrow v. The Oxford, &c., Railway Company*, 2 De Gex M. & G. 108, the point incidentally arose, and the Lord Chancellor (Lord CRANWORTH), although he did not decide it, yet took occasion to observe, in reference to the question, "It was said, suppose the manufactory was at the top of the hill, and you were burrowing under it at the distance of 1,000 feet, are you then taking part of the manufactory? I do not feel myself called upon to answer that question; but if I were, I should incline to the opinion that you are, on the principle of the maxim *cujus est solum ejus est usque ad inferos*. Can it be said that if you were an inch below the surface, you would not take a part of the manufactory? I am inclined to think that, however deep the tunnel was made, it would be within the enactment." In the case of *Pinchin v. The London and Blackwall Railway Company*, 1 Kay & Johnson, 34, however, Vice-Chancellor WOOD, referring to the same point, expressed a contrary opinion. There the company intended to throw a railway bridge over a yard belonging to a manufactory, within the walls of the manufactory, and used for the preparation of colours, a process which required air and light. They would not, however, take or touch any part of the soil. The decision, however, did not turn on this point. On appeal, Lord

CRANWORTH expressed views similar to those he had before expressed in the case of *Sparrow*. Although there has not been any positive decision on the subject, the better opinion in the profession is, that the company may be compelled to purchase the land under which they tunnel or over which they throw an arch; for *cujus est solum ejus est usque ad cælum et ad inferos*. See FREND & WARE's *Railway Precedents*, p. 153. It is understood that this has been the opinion followed in practice in a great number of Metropolitan cases, although there exists no express decision. This view is confirmed by the recent case of *Macgregor v. The Metropolitan Railway Company*, 14 Law Times, N. S. 354, in which plaintiff was the owner of a house and garden under which the defendants proposed to tunnel. The garden consisted originally of two distinct parcels of land, and the plaintiff held them under different titles. The defendants offered compensation for the house and that parcel of the garden under which they tunnelled. The point at issue was whether they could be compelled to take the whole garden, consisting as it did of distinct premises. Vice-Chancellor WOOD was of opinion that they were so bound. It thus appears to have been taken for granted, by all parties in the case, that the company were compellable to take the surface of the land under which they tunnelled, as well as any buildings thereon.

SECT. VIII.

COMPENSATION IN RESPECT OF MINERALS UNDER LINE.

See Railways Clauses Consolidation Act, 1845, section 77 to 85 inclusive (a)

(a) Similar provisions in Railways Clauses (Scotland) Act, 1845, sect. 70 to 78 inclusive.

CHAPTER XV.

WATERWORKS BILLS.

SECT. I.

STANDING ORDER 92, AND ITS CONSTRUCTION, *quoad hoc*.

The jurisdiction of the Referees, as defined by Standing Order 92, (a) is, in the case of Waterworks Bills, to inquire into all or any of the following matters as to which parties petitioning desire to be heard in opposition : viz.—

1. The nature and amount of the existing supply.
2. The nature and amount of the proposed supply.
3. The pressure.
4. The proposed mode of service.
5. The quality of the water in each case.
6. The provisions as to storage reservoirs.

On the construction of this Standing Order, in so far as it relates to Waterworks Bills, the question has been raised whether the second paragraph is to be read in connection with the first, and whether, as a consequence of that, if a Bill is not “a Bill for authorising the construction of works,” the Referees have power to inquire into the same at all. This point arose in the *Bute Docks, Cardiff (No. 2) Bill*, 1 S. & G. 16. In that case a dock had been constructed by the promoters without parliamentary sanction ;

(a) See the Standing Order *in extenso*, p. 2.

and it was supplied with water by a feeder from the River Taff. The feeder and a weir had been constructed in pursuance of the provisions of an Act of Parliament, but in a manner not authorised by that Act. By the present Bill it was proposed to legalise the feeder and weir in their present state, and to authorise the promoters to supply water from the feeder to ships in the dock. The Bill did not authorise the construction of any works, nor were there any plans or estimates deposited. It was contended for the promoters that this was not a "Waterworks Bill" within the meaning of the Standing Order, as no works were proposed to be constructed. The Referees overruled the objection.

The question has also been raised whether, where a Waterworks Bill does authorise the construction of works, the Referees have power, under the first paragraph of the Standing Order, to enquire into the engineering details, efficiency of works, and sufficiency of estimates, as well as into the matters specified in the second paragraph of the Standing Order (see *Evidence before Select Committee*, p. 16). It has, however, invariably been the practice of the Referees, in such cases, to enquire as well into the matters specified in the first paragraph, as into those specified in the second paragraph of the Standing Order.

Each Water Bill which has come before the Referees, having necessarily been attended by its own peculiar surrounding circumstances, and the Referees' decision having depended entirely upon those circumstances, the cases with which they have had to deal cannot be cited as precedents of universal applicability. It is thought, however, that a methodical review of the more important points of the Referees' decisions on such Bill will be of material assistance hereafter, as illustrating the way in which the Referees have been accustomed to deal with particular objections.

SECT. II.

OBJECTIONS BY MILLOWNERS AND INDIVIDUALS ABOUT TO BE
DEPRIVED OF THEIR SUPPLY.

No class of objections to Waterworks Bills is of more frequent occurrence than those made by owners and occupiers of mills, alleging that they will be deprived by the proposed works of the water supply which they have been previously accustomed to enjoy. The practice of the Referees has been to enquire into and report upon the amount of water compensation which ought to be provided for such petitioners. The Referees, not having themselves any power to insert clauses, cannot do more than set out in their Report the provisions necessary to be made for securing such water compensation. The general policy of Committees is, by the insertion of a clause, to require such water compensation to be provided. Very frequently, indeed, the suggestions of the Referees are adopted by the promoters, and turned into clauses settled by the parties themselves, and thus further opposition to the Bill is obviated (see *Evidence of Mr. Hassard before Select Committee*, p. 132).

In the *Bristol Water Bill*, 1855, 49, the company proposed to take the whole of certain springs called the Chelvey and Midgal Springs. The petitioners were owners and occupiers of land in the neighbourhood of these springs, and of the district adjacent to the River Kenn. They alleged that these springs were the chief feeders of the River Kenn, which waters an area of 6,000 acres used for dairy and grazing purposes, and that the abstraction of the water from the springs, if exercised according to the powers given by the Bill, would do them great injury. The promoters did not dispute the prior claim of the inhabitants of the district to a sufficient supply of water from their own springs. The requirements of the district they represented to be 3,000,000 gallons per day, and they admitted that it would be reasonable that such arrangements should be made for the pro-

tection of the district as would secure it against abstraction of the water for the use of the waterworks, when the effect of doing so would be to reduce the supply for local purposes below a minimum amount of 3,000,000 gallons per day. The Referees reported, "It will be for the Committee on the Bill to consider this suggestion."

In the *Birmingham Water Bill*, 1865, 111, the existing company proposed to divert and appropriate certain streams flowing from Sutton Park, together with two pools in the said park, and also to sink a shaft, and make a drift adit or tunnel from such shaft, and provide means for raising water therefrom for the purpose of better supplying the town of Birmingham. Certain petitioners alleged that they were owners and occupiers of mills upon the streams which flow from the pools proposed to be appropriated, and that they would be injured by the proposed works. The Referees reported, "This the promoters admitted, as they avowed that they intended to appropriate the entire supply of water, and to convert the pools into storage reservoirs." The inhabitants of Sutton Coldfield contended that they ought not to be injured by the taking away of their supply of water; that the present supply was sufficient for them; and that the small reservoir designed for the supply of Sutton Coldfield was unnecessary. The Referees reported that "Those allegations, so far as concerns the inhabitants of Sutton Coldfield, seem to be well founded." The Warden and Society of the town of Sutton Coldfield, alleged, among other objections, that the works would diminish or wholly take away the supply of water from the springs in Sutton Park, and also from the wells in Sutton Coldfield. The promoters denied that the springs in Sutton Park would be affected, but admitted that the effect of sinking the shaft and driving the adit at Sutton Coldfield might have the effect of drying up some of the wells at present existing there. The Referees reported that, "from the evidence adduced, the Referees are of opinion that the promoters are correct in their views upon both these matters." Notwithstanding the above and other objections, the Referees further reported, "that

there are no objections to the engineering details of the works proposed," and that "they are efficient for their object."

In the *Glossop Water Bill*, 1865, 157, a millowner on the Glossop Brook, about $1\frac{1}{4}$ miles below the town of Glossop, had the use of the whole of the water of the Glossop Brook, and had occasionally found that it was all required. He stored the water to the amount of 18,000,000 or 19,000,000 gallons, which had sometimes been exhausted to within a few hours' supply. Besides a large quantity of water to supply the engines and boilers, he required 3,000,000 gallons a day for washing purposes, all of which should be clean water. He objected that he would be deprived of part of his present supply of water, and that the water proposed to be delivered into the stream as compensation for that abstracted would be inadequate. It was proposed to give the millowners a compensation supply of 21 cubic feet a minute during the twenty-four hours and the whole year. The Referees reported, "that this supply of 21 cubic feet is a fair compensation for the water to be abstracted. The rainfall of the 340 acres, which will pass through the reservoirs, is calculated to afford 33,323,420 cubic feet, of which it is intended that two-thirds, or 22,215,600 cubic feet, should be supplied to the inhabitants of Glossop, and one-third, or 11,107,000 cubic feet, to the millowners." This compensation of 21 cubic feet a minute, the promoters proposed to deliver from the Blackshaw Clough Reservoir, which would be fed from the reservoirs above it. The petitioners further objected that by the proposed situation of the gauge, the moiety of the water of the Blackshaw Clough stream, which ought to be left for the free use of the millowners, would be taken credit for in the 21 cubic feet to be allowed them; but the promoters agreed that the gauge should be so placed and arranged as to ensure the millowners having that moiety in addition to the 21 cubic feet of compensation.

Water compensation one-third of rainfall.

In the *Nelson Local Board Bill*, 1866, 62, the promoters proposed to supply the town of Nelson with water. They would take by means of gauges 3 inches deep, and of

the aggregate width of 12 inches, the water of the Tatlow Brook, the Potloe Beck and the Ringstone Beck, until the same should overflow such gauges, and to carry the water so taken to a service reservoir near Marsden by iron pipes, without interfering with the drainage of the intermediate lands. These gauges would pass 220,000 gallons per day. The amount of water required for the town of Nelson was estimated at 130,000 gallons per day. A compensation reservoir of the capacity of 18,700,000 gallons was proposed to be constructed at Walverdon Water, to be supplied from the stream formed from the overflow of the before-mentioned brooks, after filling a gauge 12 inches wide by $4\frac{1}{2}$ inches deep, provided for securing a supply of water to the millowners, &c. below the compensation reservoir. This compensating reservoir, it was proved, would restore the volume of the Walverdon water to its existing volume in dry seasons for 100 days. The Referees reported that "the works will be efficient for the proposed objects."

In the *Huddersfield Water Bill*, 1866, 63, the promoters proposed to form a reservoir of 85 acres, containing more than 500,000,000 gallons supplied from an area of 1,573 acres, and to make the necessary works connected therewith. The millowners on Brow Grains Dike and other streams alleged that they would be deprived of the supply of water necessary for the working of their mills; and that the water compensation proposed by the Bill, viz., 680 gallons per minute for a working day of 12 hours, was insufficient. This compensation was calculated on the amount of one-third of an available rainfall of 16 inches per annum on an area of 1,264 acres. From the evidence given of the quantities indicated by the various rain gauges in the neighbourhood, the Referees reported that the promoters' estimate of the rainfall was too low; and that considering the advantages which would be derived from a constant and regulated, in place of a fluctuating and irregular supply, sufficient compensation would be given to the stream on which the petitioners' mills were situated, by the amount calculated on one-third of an available rainfall of

Water compensation one-third of rainfall.

21 inches. Certain other petitioners complained that no water compensation was given to the stream above their mill. It was admitted by the promoters that 309 acres was the area of catchment in which the petitioners were interested, taken for the purposes of the Bill. The Referees reported "that the water compensation to this stream should be on the same scale as that given to the first petitioners."

In the *Cambridge University and Town Water Bill*, 1866, 55, it was proposed to take certain lands and springs (not the property of the petitioner); and it was alleged (1) that by so doing they would lessen the supply of water to the petitioner's lands; and (2) that particularly by the removal of a gauge to a lower level, the petitioner would be deprived of the supply of 140 gallons per minute, to which he was entitled by an existing Act. The Referees reported that the general supply of water to the lands of the petitioner would not be diminished by the powers of the Bill; and that it was proposed to remove the gauge from a point in the brook where the quantity of water might be tested which flows into the grounds of the petitioner, to a point further down the stream where the water flows out of the said grounds and at a lower level; and that it appeared to the Referees that, "By this change the petitioner will be unable to ascertain that he receives from the company the guaranteed supply at such a point on his lands as to secure his present right."

In the *Truro Water Bill*, 1866, 94, certain millowners alleged that they would be deprived of the supply of water necessary for their mills; and that no provision was made for a compensation reservoir, by which a sufficient stream of water would be always sent down the River Allen. The promoters stated that they had taken land for the formation of an additional reservoir, and that they were prepared to make compensation in water and money to the owners and occupiers of the mills on the River Allen. The Referees reported that "no provision being made in the Bill for a compensation reservoir, the interests of the owners and occupiers of

the mills on the river would be materially injured." There were other objections (for which see p. 284). The Referees further reported that the works were inefficient, the engineering details defective, the provisions as to storage reservoirs inadequate, and taking into account the amount of compensation the promoters would be liable to pay, that the estimate was insufficient for the objects proposed by the Bill.

In the *Rochdale Water Bill*, 1866, 133, certain mill-owners complained that they would be deprived of part of the water necessary for their works, that an adequate compensation supply would not be given them, especially as some of their fulling-mills frequently worked over-hours, and sometimes (when there was sufficient water) all night, while the compensation supply would only be during 12 hours each day. The proposed compensation supply amounted to 750,000 gallons, which would be given before any water would be taken for the population. The promoters and the petitioners agreed that the rainfall of the district was about 42 inches per annum. The Referees reported that as it was shown that 750,000 gallons would be one-third of the available water from the catchment areas of the reservoirs, they considered that quantity was a proper compensation to mill-owners.

In the *Manchester Corporation Water Bill*, 1865, 145, the promoters proposed to construct two new reservoirs in the valley of the Etherow, in order to obtain an increased supply. Various mill-owners having opposed, the Referees reported, "In addition to the supplying of Manchester with water, it is necessary for the promoters to supply a quantity of water equivalent to 55 cubic feet per second for 12 hours, during 6 days in each week, to the mill-owners upon that part of the Etherow River situated below their water-works." Messrs. A., who were proprietors of a mill 536 yards from the lower reservoir, complained that they were entitled to and enjoyed the benefits of the water flowing down the River Etherow, which, if the proposed works were formed, would be abstracted, and of the use of which

Estimate insufficient on account of money compensation.

Compensation one-third of rainfall.

they would be deprived; and they further objected that, whereas they required clean water for the use of their boilers, they would be deprived of the same during the progress of the works. The Referees reported, "Very great difficulty has been experienced in arriving at any conclusion as to the actual amount of water which the petitioners now derive and enjoy from the River Etherow, and which would be abstracted from them; and on the most careful consideration, the Referees are of opinion that they will be as near the truth as it is possible to attain to, if they estimate such quantity as equivalent to a supply of 4 cubic feet per second for 12 hours during 6 days in each week;" and in regard to the supply of clean water, the Referees reported that "a service of clean water through a 4 or 5 inch pipe would suffice for their boilers. This supply could be easily afforded by the promoters."

In the *South Staffordshire Water Bill*, 1866, 67, the promoters at present had a right to pump the water from a certain well upon lands which they were now seeking powers to purchase. The shaft of this well was sunk within 60 yards of the shaft of the well situate on the brewery premises of certain petitioners, who complained that the supply of water in that well had been materially diminished by the pumping therefrom. The promoters proposed to sink the shaft of the petitioners' well to the same depth as the shaft of the promoters' well, to connect both shafts by an adit near the bottom of those shafts, to place their pumping machinery so that they should not be able to raise any water until the depth of water in the petitioners' well should exceed 10 feet, and to compensate the petitioners for any additional expense which they might incur by having to raise the water from their well so to be increased in depth. The Referees reported, that if those stipulations were carried out, the petitioners would not sustain any injury.

In the *Huddersfield Water Bill*, 1866, 63, certain petitioners complained that by certain existing works for which the promoters, the Huddersfield Water Commissioners, proposed to obtain parliamentary sanction, the natural supply to their

compensation reservoir had been diminished. The Referees reported, "It was proved that out of 500 acres, the drainage of which originally found its way into this reservoir, that of 125 acres was now carried to the reservoirs of the Huddersfield Water Commissioners. The Referees are of opinion that they were precluded from considering the question of parliamentary sanction."

In the *Glasgow Corporation Water Bill*, 1866, 191, Messrs M. alleged that, by the works proposed, the supply of water which they now derived from the River Clyde would be diminished, and also that it would be rendered impure. The Referees reported that neither the supply nor the quality of water would be affected as regarded the petitioners' works, "save so far as that it may be necessary for them to extend the pipe by which they derive their supply of water a little further and deeper into the River Clyde."

SECT. III.

OBJECTIONS TO THE AMOUNT OF PROPOSED SUPPLY, PROVISIONS FOR STORAGE, ETC.

In the *Chesterfield Water and Gas Bill*, 1865, 89, the Borough authorities and others complained that the Linaeck Brook from which the company (who already had an Act for supplying the town of Chesterfield), obtained their supply, could not afford a sufficient quantity for the parishes which the company asked for power to supply. The Referees reported, that the present supply was collected for storage by means of a reservoir containing 26,000,000 gallons, and a surface reservoir capable of containing 6,000,000 gallons; that this present supply was for the service of only 19,000 inhabitants; that the company proposed to construct another reservoir which would contain 100,000,000 gallons, so that there would be storage for 132,000,000 gallons; that the company proposed to supply 20 gallons per head per day

to a population of 38,000, which was larger than the existing population of Chesterfield and the district to be supplied; and that the amount of storage and the quantity to be supplied were sufficient.

In the *Glossop Water Bill*, 1865, 157, among other objections, it urged that the proposed supply to the town of Glossop was insufficient for the probable increase of the population. The Referees reported, that the rainfall of the 340 acres which would pass through the reservoirs was calculated to afford 33,323,420 cubic feet, of which it was intended that two-thirds or 22,215,600 cubic feet should be supplied to the inhabitants of Glossop, and one-third or 11,107,000 cubic feet to the millowners; and that the quantity of water retained for Glossop would give a supply of 20 gallons a day to 18,513 people, or 50 per cent. above the present population, which was 12,000; and that the storage capacity of the reservoirs, when enlarged as proposed, would be 6,999,940 cubic feet, which would give a storage of three months' supply.

In the *Maryport Improvement Harbour and Dock Bill*, 1866, 61, it was proposed, *inter alia*, to provide a supply of water for the use of the town of Maryport. The supply would be derived by pumping from a mill-race leading out of the River Derwent (discharging at its driest season over 26,000,000 gallons per day), as also from the residue of the River Derwent, and the stream of the Cocker. The population of Maryport was 6,000. The Referees reported that the quality of the water was not objected to, and that they considered the works efficient for the proposed object.

In the *Truro Water Bill*, 1866, 94, it appeared that the population was 12,000. The promoters proposed to make a depositing reservoir and a service reservoir, containing together 1,698,948 gallons, which, it was calculated, would yield a daily supply of 20 gallons per head. A pipe of 10 inches diameter would be used, and a pressure sufficient to reach the houses situated in the highest part of Truro obtained. The petitioners alleged that the depositing reser-

voir was inadequate for the requirements of Truro ; that the proposed works were defective in engineering details, and that the estimate was insufficient. The promoters stated that they had taken land for the formation of an additional reservoir ; that their depositing reservoir would be replenished from a gathering ground of 1,000 acres, from which they anticipated a continuous supply of 15 cubic feet per minute, in addition to the quantity stored. (No provision, however, had been made for a compensation reservoir, whereby the interests of the owners and occupiers of the mills on the river would be materially injured.) In further support of the evidence of the injury done to the petitioners, it was also shown that the company would divert the whole of the River Allen into their depositing reservoir, and that, in the summer and dry seasons, the quantity of water flowing into it might be only 15 cubic feet per minute, or little more than half the amount of 27 cubic feet per minute, which is the quantity estimated for the requirements of the population of Truro. It was also shown that the capacity of the reservoir being only sufficient for a consumption of six weeks, would give no security for an adequate and constant supply. The Referees reported that the works were inefficient, the engineering details defective, the provision as to storage reservoirs inadequate, and that, taking into account the amount of compensation the promoters would be liable to pay, the estimate was insufficient.

In the *Birmingham Water Bill*, 1865, 111, the Referees reported that the promoters would obtain a supply of 2,000,000 gallons per day from the streams flowing from Sutton Park, and an equal amount from the proposed shaft and adit ; and that the present supply for the service of the town of Birmingham was, in the dry season, 7,000,000 gallons a day, an amount barely sufficient for its present population ; that, of this quantity, 4,000,000 gallons were daily derived from the River Tame, which was becoming more and more impure every day, so that that source of supply must soon be abandoned ; and that it was absolutely

necessary to procure a further and better supply, especially as it had become necessary to afford a supply of water to districts lying outside the present district of the company ; and that the present supply for Birmingham was insufficient and that the works were efficient.

In the *Birmingham Water Bill*, 1866, 56, the promoters proposed to obtain an additional quantity of water for the use of the town of Birmingham, and to discontinue gradually the use of the River Tame, now one of the sources of supply. The amount of water supplied by the company was stated to be about 7,500,000 gallons per day at its maximum, and of this about 4,000,000 gallons were derived from the River Tame, the quality of which, particularly in dry seasons, was very impure and unsuitable for domestic uses, without a considerable admixture of purer water derived from other sources. The Referees reported, "From the evidence laid before them, the Referees are of opinion that the works intended will be efficient for the objects proposed by the Bill."

SECT. IV.

OBJECTIONS TO QUALITY OF PROPOSED SUPPLY.

In the *Cheltenham Water Bill*, 1865, 137, the company proposed to take a supply of water from the Severn at a point called Mythe, 9 miles from Cheltenham. The petitioners alleged that the Severn water at the proposed point of supply was of an impure and unwholesome quality, and unfit to be drunk. They adduced evidence to show that the water taken from the Severn above Worcester (16 miles higher up than Mythe), and supplied to that town, was of bad quality ; that at Mythe the water was less suited for consumption, inasmuch as before reaching that point it received the sewage of Worcester and Upton ; that immediately below Mythe it was joined by the Avon, a turbid stream which drains a considerable district ; that

a weir erected about half-a-mile below the junction retarded the flow of water which, being rendered almost stagnant in summer when the river is low, became very offensive ; that at high tides, more especially at equinoctial spring-tides, not only was the water of the Avon forced upwards, but the sewage of Gloucester was carried over the weir into the river above. For the promoters, witnesses were called to show that the Severn water was used at Worcester not only for domestic purposes but frequently for drinking, and that no injurious consequences had been complained of ; that below Worcester, the Tame, a considerable river and purer than the Severn, falls into it ; that the water at the proposed source of supply was not inferior to that supplied to Worcester ; that although the river might at times, owing to freshes, unusually high tides, or other exceptional circumstances, be in a condition unfavourable for consumption, no bad consequences need ensue, inasmuch as the company possessed storage reservoirs equal to 34 days' supply for the town of Cheltenham, and could therefore abstain from pumping for a period. It was also stated that the Severn at Mythe compares favourably with the Thames above Teddington Lock (the point from which London is in a great measure supplied), and with other rivers ; and that although, as is commonly the case with river water, inferior in freshness to spring water, it was in some respects superior to the company's present supply. The Referees reported "that there were no sufficient objections to the proposed source of supply and the quality of the water."

In the *Birmingham Water Bill*, 1865, 111, it was objected that the water to be supplied would be taken from two distinct sources, one the upper measure of new red sandstone which contains good water, the other the lower measure, in which the water is hard and unfit for domestic consumption. The Referees however reported that, "Much evidence was given with respect to the quality of the water in both the upper and lower measures of new red sandstone ; and, in the opinion of the Referees, the water from both sources is well fitted for domestic consumption."

See also *Bute Docks, Cardiff (No. 2) Bill*, 1865, 313, *ante*, p. 122, where the dock proprietors sought powers to supply the shipping with water which was alleged to be impure and unwholesome.

Impurity of existing supply.

As to impurity of the existing source of supply, see *Birmingham Water Bill*, 1865, 111, p. 285; and *Birmingham Water Bill*, 1866, 56, p. 286.

SECT. V.

OBJECTIONS IN REFERENCE TO PRESSURE.

By the Waterworks Clauses Act, 1847, it is provided that “the undertakers shall provide and keep in the pipes to be laid down by them a supply of pure and wholesome water, sufficient for the domestic use of all the inhabitants of the town or district within the limits of the special Act, who, as hereinafter provided, shall be entitled to demand a supply, and shall be willing to pay water-rate for the same; and such supply shall be constantly laid on at such a pressure as will make the water reach the top story of the highest houses within the said limits, unless it is provided by the Special Act that the water to be supplied by the undertakers need not be constantly laid on under pressure. . . .”

The question of pressure has been raised in several cases. In the *Glossop Water Bill*, 1865, 157, it was objected that the proposed supply was brought from too low a level. The Referees reported, “There are 2,580 houses in Glossop and the district round it, and there are not above 100 houses which are above the level of the surface-water of the Swinehaw Reservoir. These (some of them being farm-houses) have their own supplies of water.” In the *Birmingham Water Bill*, 1866, 56, the Referees reported that “The present supply is not available for high service to all the houses in Birmingham, the extreme height to which it

is raised being 311 feet. It is not proposed to construct any reservoir at a higher level than the existing reservoirs, except one at Upper Edgbaston for local purposes ;" and they also reported that the proposed works would be efficient. In the *Weardale and Shildon District Water Bill*, 1866, 182, the Referees reported that, " from the undulating nature of the country, the amount of pressure would vary in different places ; but that as the water was conveyed from 1,100 feet above the level of the sea down to 400 feet, the pressure would require to be controlled to prevent the bursting of the pipes ;" and they also reported that the proposed works would be efficient. In the *Truro Water Bill*, 1866, 94, the Referees report, among other matters, that a pressure would be obtained " sufficient to reach the houses situated in the highest part of Truro."

SECT. VI.

OBJECTION THAT PREFERABLE SUPPLY MIGHT BE OBTAINED FROM OTHER SOURCES.

As in railway Bills, the Referees will not entertain any objection that a preferable route beyond the limits of deviation might have been taken, so in Waterworks Bills, the Referees consider themselves precluded from entering upon any enquiry as to whether a preferable supply of water might not be obtained from a different source. This point directly arose in the *Cheltenham Water Bill*, 1865, 137 (see p. 286), where, objections having been strenuously urged to the quality of the proposed supply, the Referees reported, " Evidence was tendered by the petitioners to show that preferable supplies might be derived from other sources. The Referees did not, however, consider themselves at liberty to enter into an enquiry on the subject." At first sight, this decision appears to militate against the earlier decision in the *Chesterfield Water, &c., Bill*, 1865,

89, where the Referees reported that the proposed supply was "as good as can be procured in that locality;" but, on a closer examination into the facts, the two decisions would appear to be reconcileable. The facts of the latter case were these: by the Bill it was proposed to confer further powers upon the Chesterfield Waterworks, &c., Company, to construct additional works. The existing and proposed source of supply was the Linacre Brook. The corporation and the ratepayers of the borough complained that "the present supply of water was impure, and unwholesome, and unfit for storage purposes;" and that "the upper reservoir proposed to be constructed on the said stream would only collect surface water, impregnated with animal and vegetable matter." On this point the Referees reported, "The Referees are satisfied that the water of the Linacre Brook is as good as can be procured in that locality. It is soft, which is rather an advantage for general use; and there was evidence given that it would be improved by being stored and aërated in large open reservoirs." Although, therefore, the Referees, in their report, use an expression implying comparison, yet it does not appear from the report that any other source of supply was suggested by the petitioners.

SECT. VII.

ESTIMATE INSUFFICIENT LOOKING TO AMOUNT OF MONEY COMPENSATION CLAIMABLE BY MILLOWNERS, ETC.

The estimate in Waterworks Bills, as in other cases, must be sufficient to cover claims of money compensation. In the *Truro Water Bill*, 1866, 94, certain millowners and occupiers on the River Allen objected that they would be deprived of the supply of water necessary for the working of their mills, and that no provision had been made for a compensation reservoir by which a sufficient stream of water would be always sent down the river. The promoters

stated that they had taken land for the formation of an additional reservoir, and that they were prepared to make compensation in water and money to the petitioners. The Referees reported that, "taking into account of compensation the promoters will be liable to pay, the estimate was insufficient for the objects proposed by the Bill."

SECT. VIII.

EFFECT OF ADVERSE REPORT BY REFEREES.

If the Referees report that the engineering is inefficient for the proposed object, or that the estimate is insufficient, then, by Standing Order No. 96, the Bill cannot be further proceeded with unless the House shall otherwise order. But if the Referees reported adversely in regard to either the nature and amount of the existing and proposed supply, the pressure, proposed mode of service, the quality of the water, or the provisions as to storage reservoirs, then, although the Bill may be further proceeded with, and brought for consideration before the Committee, yet the findings of the Referees on these points are conclusive before the Committee, it being provided by Standing Order No. 95, that, "No further evidence shall be taken by the Committee upon any of the matters reported upon by the Referees."

CHAPTER XVII.

GAS BILLS.

SECT. I.

STANDING ORDER 92, AND ITS CONSTRUCTION.

The matters into which the Referees are directed, by Standing Order 92, to enquire in reference to Gas Bills, are—

1. The quality of the gas;
2. The existing supply;
3. Its price ; (a)
4. The amount of pressure;
5. The cost of production;
6. The modes of testing the purity and illuminating power of the gas ; and,
7. The proposed maximum price to be charged.

There existed, at first, considerable doubt as to whether the Referees had power to enquire into the engineering details, &c., of Gas Bills. As the Standing Order was originally worded (see Standing Order 93 for 1865), the Referees were only empowered to enquire into such matters “in the case of Bills of *the second class* for authorising the

(a) By sections 29 to 35 of the Gas-Works Clauses Act, 1847, certain provisions are made in regard to the profits of gas companies, the maximum rate of dividend to be paid, the application of profits, when more than prescribed amount, towards reduction in price of gas, &c.

construction of works;" and, as Gas Bills are of the *first* class (see Standing Order 11), the Referees considered that the effect of the words above quoted was to preclude them from entertaining questions of engineering in connection with Gas Bills. (a)

In the Standing Order for Session 1866, however, as well as in that for Session 1867, the words "of the second class" have been omitted; so that there cannot now, it is apprehended, be any question as to the jurisdiction of the Referees over the engineering details of Gas Bills.

But even in the Session 1865, where a Gas Bill took also power to construct a work properly belonging to the second class, the Referees enquired into the engineering details of such work. By the *Bath Gas Bill*, 1865, 43, it was proposed to construct a tramway or railway for the purpose of connecting the gas-works with the Midland Railway, which was to be effected by means of a bridge over the River Avon, consisting of two spans 70 feet each, with a pier in the centre of the river. The Great Western Railway opposed, and alleged obstruction to navigation (see p. 191), but the Referees reported that they "did not consider this allegation well founded, and did not consider that there was any objection to the engineering details, or the sufficiency of the works proposed."

(a) "With regard to gas bills there is very great doubt whether the Referees have the power to inquire into the engineering. There is such a thing as the laying of mains; and actually upon that will sometimes depend the site of the Gas Works,—as to whether they have to overcome a hill between the manufacturer of the gas and the point of supply. As I have read the Standing Orders, I think that we are precluded from going into that question. The words are 'the amount of the pressure.' In fact that question of pressure has never been raised for that reason."

Chairman. Surely the amount of pressure is strictly engineering? But engineering is not included under this paragraph of the Standing Order; the engineering details seem to be confined to the first paragraph of the Standing Order, and that is in the case of Bills of the second class. Now Gas Bills are not in that class, and that is a question which is continually raised.

Mr. Milner Gibson. Does it not apply also to waterworks?—It does to some extent; but I think that waterworks are included in Bills of the second class." (See *Evidence of Mr. Hassard before Select Committee* (8th June, 1865), Q. 142–4.)

SECT. II.

GAS BILLS IN PAST SESSIONS.

In the *Bath Gas Bill*, 1865, 43, the only question raised (other than the question of engineering before referred to) was in regard to the cost of production. The Referees reported that, according to the evidence of the secretary of the company, the total cost was 2s. $7\frac{1}{2}d.$ per 1,000 feet, and that by adding a sum of 1s. 2d. per 1,000 feet, the sum required to pay 8 per cent. on the company's capital (being the maximum dividend which they were allowed to divide), the cost of production was brought up to 3s. $9\frac{1}{2}d.$ per 1,000 feet ; that in this estimate no credit had been given for the residuary matter sold ; and that 3s. 9d. per 1,000 feet was the amount actually charged to consumers in Bath.

3s. 9d. per
1000 feet.

Power 13
candles.
5s. per 1000
feet.

In the *Torquay Gas Bill*, 1865, 138, the Referees reported, "It was agreed upon by the promoters and petitioners that the Referees should report that the illuminating power of the gas at present supplied in the district of Tormoham is equivalent to 13 sperm candles, and that the price charged to private consumers is 5s. per 1,000 feet."

Illuminating
power.

In the *Exeter Gas (No. 1) Bill*, 1865, 139, which was a Bill to repeal and consolidate existing Acts, and for other purposes, the inhabitants of Exeter complained that the gas supplied was inferior in quality, insufficient in quantity, and high in price. The Referees reported that it was proved by many witnesses that up to a period of six or seven months ago, many and well-grounded complaints had been made as to the quality of the gas ; but that within the latter period a marked improvement had taken place ; that within that period several analyses of the illuminating power of the gas supplied had been made ; and these analyses the Referees detailed, showing that the illuminat-

ing power fluctuated up to $15\frac{1}{2}$ sperm candles, and was usually equal to 13 or 14 candles; they further reported that the quantity of sulphur found upon those analyses varied much (from 4 to 19 grains per 100 feet), but that the largest amount had been within the amount allowed by the Consolidated Gas Act; that, as regards the quantity supplied, experiments had been made to ascertain the quantity supplied to the public lamps of Exeter; that by the contract under which the company had undertaken to supply the public lamps, it was provided that the flame of the lamps should be of a given size, therein specified, and the experiment was made by comparing a brass plate cut to the size and form specified in the contract with the flame of the lamps; that this mode of testing was liable to some error, but that the Referees were of opinion that, on the whole, the conclusions arrived at by the persons who made the experiments were substantially correct; that the results of the experiment were as follows: of 563 lamps experimented upon, the flame of 147 lamps was of full contract size, that of 186 lamps of three-fourths the contract size, that of 9 lamps of two-thirds, that of 115 of one-half, and that of 4 of one-fourth the contract size; that it had been abundantly proved that the supply of gas had been insufficient to supply stoves by day, or to afford a sufficient supply to manufacturing establishments which required to be lighted throughout the night; that the price charged to consumers had been reduced to 4s. per 1,000 feet, meter rent being included in that charge; and that the cost of coals had been returned by the company as 16s. 2d. per ton for the year 1863.

In the *Folkestone Gas Bill*, 1865, 141, on the opposition of the Corporation of Folkestone, the Referees reported as follows:—"The petition complained that no means were provided in the Bill for testing the quantity of gas consumed by the public lamps. It was agreed upon between the promoters and petitioners that the present charge of £3 10s. 8d. per annum for lighting each public lamp is equivalent to a charge of 4s. 6d. per 1,000 feet. The price charged to ordinary consumers is 5s. 6d. per 1,000 feet.

Quantity of sulphur.

Experiments as to supply to public lamps.

The test applied.

Brass plate cut to contract size.

Results of these experiments.

Supply insufficient.

Price 4s. per 1,000 feet.
The cost of coals.

Supply to public lamps.

5s. 6d. per 1,000 feet.

In the *Gosport Gas Bill*, 1865, 142, A. complained "that the quality of the gas hitherto supplied had been inferior, and that the supply had been wholly inadequate." It appeared that the gas cooking apparatus at Haslar Hospital had had to be discontinued in consequence of the deficiency of the supply. The price of gas coal in Gosport was 14s. per ton; and 15s. 6d. delivered at the works. The promoters in reply offered no evidence on the point of the supply; but proved that the illuminating power throughout the last year had given an average to equal 14 candles. The Referees reported that the present supply was inadequate, and that the quality now supplied was good.

In the *Preston Gas Bill*, 1865, 147, the Corporation of Preston and other petitioners complained that the gas supplied was inferior in quality and quantity; that the means of testing the purity of the gas required alteration; that the price was too high; and that there was needless expenditure in the manufacture and distribution of the gas. The promoters and the several petitioners agreed to a detailed statement of facts (embodied in the Referees' Report), entitled "Questions for Court of Referees, with answers thereto agreed upon, &c." This statement had reference to the existing supply, its quality and its price, as well as to pressure, cost of production, and modes of testing the illuminating power and purity.

In the *Sheffield United Gas Bill*, 1866, 57, the Corporation of Sheffield alleged that the illuminating power was not sufficient, and might be increased without addition to the price. The illuminating power required by the existing Act was equal to $10\frac{1}{2}$ sperm candles; but the gas actually supplied was of an average of 16 sperm candles. The price was 3s. per 1,000 feet on an annual consumption exceeding 500,000 feet, and 3s. 6d per 1,000 feet to all consumers of less than that amount. Evidence was given that the cost of increased illuminating power might be estimated at $1\frac{1}{2}d.$ per 1,000 feet for each additional candle. Upon these grounds, the Referees reported that the minimum illuminating power of 15 sperm candles would be a reasonable amount under the circumstances of the case.

Price of coal.

Power 14 candles.

Parties agreeing on facts to be reported.

Power 16 candles.

3s. 6d. per 1,000 feet.

In the *Brighton and Hove General Gas Bill, 1866, 77*, it was proposed to increase the limits of the Company's district. The Referees reported that the gas at present supplied by the Company had upon the average an illuminating power equal to $12\frac{1}{2}$ candles, and it was of a sufficiently pure quality ; that the supply was sufficient in quantity ; that the prices charged were, at Brighton and Hove 4s., at New Shoreham, Kingston, and Southwick, 5s., and at Portslade 6s. per 1,000 feet ; for the public lamps at Brighton £4, at Hove £4 10s., and at New Shoreham, £2 5s. each per annum. That the pressure at the Town Hall and also at the company's office, Ship Street, was sufficient for all purposes, being at its minimum about the pressure due to $\frac{7}{10}$ of an inch of water ; that the present cost of production is 2s. 9d. per 1,000 feet, exclusive of any charge for interest on capital ; that the present place of testing pressure and illuminating power at the company's offices in Ship Street (which is about two miles from the place of manufacture) is well suited for that purpose, being at a distance (over 1,000 yards) from the place of manufacture, but that an officer to be appointed for that purpose ought to have access at all reasonable times to said office, for the purpose of testing, without giving previous notice to the company ; that the testing-burner described in the Bill was suitable for the purpose, but that a model of it shall be deposited. The Referees also reported certain facts connected with the cost of supply ; and in regard to a certain piece of land, they reported that the same was well suited for gas works, but that no powers were taken in the Bill to obtain access from same to the high road.

Power 12½
candles.

4s., 5s., and 6s.
per 1,000 feet.

Price for pub-
lic lamps.

Pressure.

Cost of pro-
duction.

Present place
of testing
pressure, &c.
Two miles
from place of
manufacture.

Testing
burner.
Model should
be deposited.

Suitableness
of proposed
site.

No access
from high
road provided.

SECT. III.

CASES WHERE ALL QUESTIONS IN GAS BILLS SUBMITTED TO
REFEREES.

Hitherto, the only Bills in reference to which parties have availed themselves of the provisions of Standing Order 94 (by which, if the promoters and opponents of any Bill shall agree to that course, all the questions in issue may be submitted to the Referees), have been Gas Bills. There have been two such instances. In the *Neath New Gas Bill*, 1866, 316, all questions having been so referred, the Referees reported "that subject to certain proposed amendments made in and annexed to the Bill, which the Referees recommend should be made therein, they are of opinion that the said Bill ought to be proceeded with." And in the *Worksop and Shireoaks Gas Bill*, 1866, 317, which was in like manner wholly referred, the Referees reported "that the quality of the gas supplied by the existing company is sufficiently good, the illuminating power being equal to that required by their Act, and that the supply is also sufficient; and the Referees are of opinion that this Bill ought not to be proceeded with, the opponents undertaking to reduce the price of gas to 4s. per 1,000 feet from the 1st January next."

INDEX OF BILLS

REFERRED TO IN THE TEXT.

	<small>PAGE</small>
Aberdare Valley and Caerphilly Junction Railway Bill (1866, 115)	78
Aberystwith and Welsh Coast Railway (1865, 293)	195, 197
Aboyne and Braemar Railway Bill (1865, 216) ...	154, 158, 178
Acton and Twickenham Railway Bill (1865, 193)	234
Afon Valley Railway Bill (1865, 315)	98, 110, 135, 245
Alexandra [*] (Newport) Docks Bill (1865, 292)	15, 220, 230
Barnet, Hendon, and Midland Junction Railway Bill (1866, 205)	16, 32, 76
Barnet, Hendon, Hampstead, and London Railway Bill (1865, 69)	11, 81,
	93, 94, 112, 130, 217
Barry Railway (Penarth and Cardiff Extension) Bill (1866, 132) ...	120
Bath Gas Bill (1865, 43)	5, 10, 191, 293, 294
Bedford, Northampton, and Weedon Railway Bill (1865, 67)	31, 82, 126,
	162, 165, 171
Belfast New Streets Bill (1865, 291)	245, 252
Birkenhead and Liverpool Railway Bill (1865, 285)	6, 122, 197, 218, 252
Birmingham Water Bill (1865, 111)	277, 285, 287
Birmingham Water Bill (1866, 56)	286, 288
Bishop's Castle Railway (Extensions to Craven Arms) Bill (1865, 194)	213
Bo'ness, Grangemouth, and South Alloa Junction Railway Bill (1866, 264)	76, 158, 162
Brecon and Merthyr Tydfil Junction Railway Bill (1865, 425)	88, 91, 114,
	125, 159, 199, 219
Brecon and Merthyr Tydfil Junction Railway (Northern Lines) Bill (1866, 223)	40, 52, 249
Brighton and Hove General Gas Bill (1866, 77)	297
Bristol and North Somerset Railway (Deviation) Bill (1866, 121)	99, 102
Bristol and North Somerset Railway (Southern Extension) Bill (1866, 323)	21
Bristol Water Bill (1865, 49)	276

	PAGE
Brixton, Clapham, and Balham Extension Railway Bill (1866, 165)	76, 111, 233
Bromyard and Hereford Railway Bill (1866, 88) 16, 36, 54, 70, 74, 81, 110	
Buckley Railway (Docks, &c.) Bill (1866, 105)... ... 200, 202, 220, 250	
Burton-upon-Trent and Nottingham Railway Bill (1865, 217) 17, 66, 76,	78, 81, 147
Bute Docks, Cardiff (No. 1) Bill (1865, 305) 7, 23, 35, 38, 89, 200, 201, 220,	227, 229
Bute Docks, Cardiff (No. 2) Bill (1865, 313) 221, 274	
Bute Docks, Cardiff, Bill (1866, 122) 201, 220	
Caledonian Railway (Balerno and Penicuik Branches) Bill (1865, 175)	31, 104, 119
Caledonian Railway (Glasgow South Side Railways, &c.) Bill (1865, 106) 31, 41, 155, 181, 185	
Caledonian Railway (Greenock and Gourock Extensions) Bill (1866, 109) 32, 67, 75, 78, 214	
Caledonian Railway (Lanarkshire, &c., Branches) Bill (1866, 215) ... 248	
Callander and Oban Railway Bill (1865, 176) 22, 133, 166	
Cambridge University and Town Water Bill (1866, 55) 280	
Cannock Chase and Wolverhampton Railway (Hednesford Extension) Bill (1866, 118) 238	
Cannock Chase Railway (Extension) Bill (1866, 116) 99, 102	
Central Wales and Staffordshire Junction Railway Bill (1865, 215)	31, 152, 157
Cheltenham Water Bill (1865, 137) 286, 289	
Chester and West Cheshire Railway Junction Bill (1866, 89) ... 87, 91	
Chesterfield Water and Gas Bill (1865, 89) 283, 289	
Chichester and Midhurst Railway Bill (1865, 50) 140, 150	
Chipping Norton, Banbury, and East and West Junction Railway Bill (1865, 195) 42, 115, 121, 133	
City, Kingston, and Richmond Railway Bill (1866, 177) ... 115, 234	
Colnbrook Railway Bill (1866, 189) 105	
Connah's Quay Railways and Docks Bill (1865, 258) ... 62, 196, 231	
Craven Junction Railway Bill (1866, 110) 24, 225	
Crofthead and Kilmarnock Extension Railway Bill (1865, 77) 31, 62, 132,	135
Croydon, Mitcham, and Kingston Railway Bill (1866, 92) 74, 75, 111,	124, 238
Crystal Palace New Railways Bill (1865, 159) 36, 65, 82, 156	
Deal and Dover Railway Bill (1865, 54) 32	
Dee and Mersey Junction Railway Bill (1865, 269) 45, 190, 200	
Devon and Somerset Railway (Deviations) Bill (1866, 101) 225	

	PAGE
Dover, Deal, and Sandwich Railway Bill (1865, 54)	32
East and West Junction Railway Bill (1865, 66)	31, 39, 242
East and West Yorkshire Union Railway Bill (1865, 237)	31, 149, 152
East London Railway Bill (1865, 113)	64, 127
East London Railway (South Western Extension) Bill (1866, 167) ...	38, 115
Edgware, Highgate, and London Railway Bill (1865, 90)	175
Edgware, Highgate, and London Railway Bill (1866, 193)	32, 187
Edinburgh and Glasgow Railway (No. 2) Bill (1865, 359)	90, 183, 185
Edinburgh and Glasgow Railway (No. 3) Bill (1865, 457)	38
Ely and Ogmore Valleys Junction Railway Bill (1865, 423) ...	41, 55, 134
Ely Valley and Vale of Neath Junction Railways Bill (1866, 90) ...	131, 136
Evesham and Redditch Railway Bill (1865, 85)	58, 79
Exeter Gas (No. 1) Bill (1865, 139)	294
Fareham and Netley Railway Bill (1865, 72)	47, 194
Folkestone Gas Bill (1865, 141)	295
Forth Bridge Bill (1865)	6, 9
Fulham Railway Bill (1865, 127)	70, 170
Furness Railway Bill (1865, 79)	47, 194, 200
Garth Quarry Railways Bill (1865, 314)	38, 171
Glasgow and North Western Railway Bill (1865, 369)	236
Glasgow and South Western Railway (Additional Powers) Bill (1865, 373)	95
Glasgow and South Western Railway (Additional Powers) Bill (1866, 192)	121
Glasgow and South Western (Kilmarnock Direct) Bill (1865, 78) ...	31, 250
Glasgow City, Suburban, and Harbour Railway Bill (1865, 186) ...	19, 125
Glasgow (City) Union Railway Bill (1865, 105)	31, 151, 155
Glasgow Corporation Water Bill (1866, 191)	283
Glossop Water Bill (1865, 157)	278, 284, 288
Gosport Gas Bill (1865, 142)	296
Great Northern Railway (Additional Powers) Bill (1 S. & G. 5) ...	12
Great Northern Railway (Potter's Bar, Barnet, and Hendon) Bill (1866, 194)	32, 120
Great Western Railway Bill (1 S. & G. 124)	94
Great Western Railway (Further Powers) Bill (1866, 233) ...	33, 185
Greenock and Ayrshire Railway Bill (1866, 287)	32, 116, 214
Greenock Harbour Bill (1866, 98)	228
Greenock Railway Bill (1865, 187)	37, 152, 157, 231
Hadlow Railway Bill (1865, 51)	61
Hadlow Railway Bill (1866, 66)	85, 105, 115, 173, 218

	PAGE
Halesowen and Bromsgrove Branch Railway Bill (1866, 235)	95, 255
Havant, Hambledon, and Droxford Railway Bill (1865, 45)	16, 69, 116, 164
Holderness Embankment and Reclamation Bill (1866, 507)	...200, 201, 207
Hornsey and Kingsland Junction Railway Bill (1865, 91)	... 45, 209
Huddersfield and Halifax Railway Bill (1866, 162)	... ... ... 249
Huddersfield Water Bill (1866, 63)	... ... ... 279, 282
Hull Docks Bill (1866, 91)	... ... ... 97, 220
 Isle of Wight Railway Bill (1865, 493)	 148
 Kingsbridge Railway Bill (1866, 123)	 148
King's Lynn Docks and Railway Bill (1865, 73)	... ... ... 211
 Lancashire and Yorkshire and Midland and Leeds, Bradford, and Halifax Junction Bill (1 S. & G. 3)	 12
Lancashire and Yorkshire Railway (Additional Powers) Bill (1865, 239)	86, 114, 122, 154, 178, 218
Lancashire and Yorkshire Railway (West Riding Branches) Bill (1866, 161)	... ... ... ... ... ... 116, 158, 183
Lancashire Union Railways Bill (1865, 276)	... ... ... 31, 148, 149
Launceston, Bodmin, and Wadebridge Junction Railway Bill (1865, 375)	... ... ... ... ... ... ... 17, 36, 53
Leeds, North Yorkshire, and Durham Railway Bill (1865, 219)	44, 50,
84, 93, 112, 113, 122, 138, 141, 164, 165, 168, 178, 179, 180, 209, 226, 240, 241, 243	
Llanelli Railway and Dock Bill (1866, 271)	... 200, 203, 220, 221, 222
Llanelli Railway and Dock (Extension to Mumbles) Bill (1865, 494)	97, 222
Llantrisart and Taff Vale Junetion Railway Bill (1865, 422)	19, 43, 139
Llantrisart and Taff Vale Junetion Railway Bill (1866, 153)	32, 124, 211, 226
London and North Western and Midland Counties Coal Fields Railway Bill (1866, 195)	... ... ... ... ... 14, 63, 123
London and North Western Railway (New Works, &c.) [England and Scotland] Bill (1865, 242)	... ... ... ... 60, 148
London and South Western Railway (Additional Powers) Bill (1866, 178)	... ... ... ... ... ... .. 167
London, Brighton, and South Coast Railway (Additional Powers) Bill (1865, 143)	... ... ... ... ... 64, 119, 128, 129
London, Brighton, and South Coast Railway (St. Leonard's Line and Hastings Lines) Bill (1866, 254)	... ... ... ... 58, 217
London, Brighton, and South Coast Railway (St. Leonard's and Deviations) Bill (1865, 57)	... ... ... ... ... 106, 150

	PAGE
London, Brighton, and South Coast Railway (Various Powers) Bill (1866, 255)	164, 173
London, Chatham, and Dover and South Eastern (Bromley, Farn- borough, and West Wickham) Railways Bill (1866, 315) 111, 225, 227	
London, Chatham, and Dover, and South Eastern (Kennington, Clap- ham, and Brixton) Railways Bill (1866, 163)	76, 185, 216
London, Chatham, and Dover Railway (No. 2) Bill (1865, 59) ...	64
London, Worcester, and South Wales Railway Bill (1865, 86) 54, 79, 85, 132, 156, 218	
Louth and Lincoln Railway Bill (1866, 234)	33, 105
Lynn and Sutton Bridge Railway Bill (1865, 74)	71
Macclesfield, Knutsford, and Warrington Railway Bill (1866, 93) 238, 255	
Maidstone and Ashford Railway Bill (1866, 65)	19, 57, 120
Manchester Corporation Water Bill (1865, 145) ... ...	.. 281
Manchester, Sheffield, and Lincolnshire Railway (Central Station and Lines) Bill (1866, 261 and 297) 21, 25, 36, 48, 126, 175, 176, 183, 213	
Maryport Improvement Harbour and Dock Bill (1866, 61) 8, 10, 221, 225, 229, 284	
Metropolis Sewage and Essex Reclamation Bill (1865, 117) ...	... 206
Metropolitan and St. John's Wood Railway Bill (1865, 109)...	... 146
Midland Railway (Ashby to Nuneaton, &c.,) Bill (1866, 117)	164, 168
Midland Railway (Barnsley to Kirkburton) Bill (1865, 241)...	... 153
Midland Railway (Branches, &c.,) Bill (1866, 119)	91, 96
Midland Railway (New Lines, &c.,) Bill (1865, 223) 100, 147, 164, 166, 182	
Midland Railway (Settle to Carlisle) Bill (1866, 213)...	... 20
Mold and Denbigh Junction Railway (Extensions) Bill (1865, 264) 41, 53, 65, 71, 138	
Mold and Denbigh Railway (Branches) Bill (1866, 220)	56
Moses Gate and Ringley Branch Road Bill (1865, 294)	172
Neath New Gas Bill (1866, 316)	49 298
Nelson Local Board Bill (1866, 62) ... ... ... ...	... 277
Newport and Usk Railway Bill (1865, 299)	19, 110
North British Railway (Additional Powers) Bill (1865, 178)...	... 163
North British Railway (Camps, &c., Branches) Bill, (1866, 375) 63, 123	
North British Railway (Carlisle Citadel Station Branch) Bill (1865, 297)	41, 59, 66, 68, 69, 73, 97
North British Railway (Glasgow Branches) Bill (1866, 221) 34, 67, 119, 176, 227	
North British Railway (Lasswade Branches) Bill (1865, 174) 21n, 31, 118, 157, 240	
North British Railway (Tay Bridge) Bill (1866, 246)	14, 190

	PAGE
North Kent Railway Bill (1865, 511)	158
North Londen, Highgate, and Alexandra Park Railway Bill (1865, 172)	246, 252
North of England Union Railway Bill (1865, 235) ...	31, 95, 116, 148, 149, 244
North Surrey Railway Bill (1865, 110)	44, 72, 172, 208, 215
North Wales, Birkenhead, and Liverpool Railway Bill (1866, 106) ...	37, 197, 218, 228
Ogmore Valley Railways (No. 1) Bill (1865, 420) ...	35, 59, 109, 131
Ogmore Valley Railway (No. 1) Bill (1866, 152) ...	100, 134
Ogmore Valley Railway (No. 2) Bill (1866, 152) ...	31, 211, 226
Okehampton Railway Bill (1865, 92)	36, 52, 156, 171
Pembroke and Tenby Railway Bill (1866, 256)	61, 239
Perth General Railway Station Bill (1865, 180) ...	41, 68
Perth General Railway Station, Scottish Central, &c., Railway Companies Bill (1865, 179)	42, 133
Peterborough, Wisbeach, and Sutton Railway Bill (1865, 119) ...	61
Piccadilly and Park Lane New Road Bill (1865, 196) ...	187, 246, 247, 256
Poole and Bournemouth Railway Bill (1865, 53) ...	42, 108
Preston Gas Bill (1865, 147)	296
Regent's Canal (Limehouse Basin and Cut) Bill (1865, 173) ...	181, 186
Rhymney Railway Bill (1866, 216)	24, 176
Rochdale Water Bill (1866, 133)	281
Ryde Station and Railway Bill (1866, 399)	34, 97
Severn Junction Railway Bill (1865, 361)	22 n, 193, 200
Sheffield United Gas Bill (1865, 57)	296
Shrewsbury and Potteries Junction Railway Bill (1865, 257) ...	54
Southam Railway Bill (1866, 359)	100
South Eastern and London, Chatham, and Dover (London, Lewes, and Brighton) Railways Bill (1866, 154)	233
South Lancashire Railways and Dock Bill (1865, 273) ...	15, 17, 31, 38, 45, 98, 99, 101, 111, 149, 210, 222, 244
South Staffordshire Water Bill (1866, 67)	282
South Wales and Great Western Direct Railway Bill (1865, 353) ...	6, 9, 14, 191, 201
Spalding and Bourne Railway Bill (1865, 286)	135
Surrey and Sussex Junction Railway Bill (1865, 75) ...	43, 64, 136
Swansea and Aberystwith Junction Railway Bill (1865, 419) ...	19, 43, 55, 109, 141
Swansea and Clydach Railway Bill (1866, 263) ...	32, 90, 91, 171, 251

	PAGE
Swansea Vale and Neath and Brecon Junction Railway Bill (1865, 372)	60
Swansea Vale Railway Bill (1866, 245)	236
Thames Subway Bill (1866, 429)	199, 219
Torquay Gas Bill (1865, 128)	294
Tottenham and Hampstead Junction Railway (New Lines) Bill (1865, 128)	20, 42, 108
Trowse Road Bill (1865, 41)	21n, 22
Truro Water Bill (1866, 94)	243, 280, 284, 289, 290
Vale of Crickhowell Railway (Western Extension) Bill (1865, 368)	13,
	23n, 117, 121, 155
Vale of Neath Railway (Swansea Lines) Bill (1865, 367) ...	63, 89, 101
Watford and Edgware Junction Railway Bill (1866, 190) ...	51, 210
Weardale and Shildon District Water Bill (1866, 182) ...	289
West Bromwich and Walsall Railway Bill (1866, 217) ...	34, 36, 56, 59, 73
Whitehaven and Furness Junction Railway Bill (1865, 80) ...	46, 196,
	200, 239
Wolverhampton and Bridgnorth Railway Bill (1865, 234) ...	31, 85, 119, 215
Wolverhampton and North Staffordshire Junction Railway Bill (1 S. & G. 125)	134
Wood Green, Winchmore Hill, and Enfield Railway Bill (1865, 108) ...	43,
	75, 137
Worksop and Shireoaks Gas Bill (1866, 317)	49, 296
Wrexham and Minera Railway Bill (1865, 263) ...	18, 141, 162, 212, 213
Wrexham, Mold, and Connah's Quay and Hoylake Railways Bill (1866, 107)	196
Wrexham, Mold, and Connah's Quay Railway Bill (1865, 260) ...	62, 83,
	109, 117, 123, 124, 149, 163

GENERAL INDEX.

ABANDONMENT,

- of Bill on account of adverse report, 38.
- of part of scheme before Referees, 25, 39.
- Estimates, how dealt with when portion of line abandoned, 236.

ACCESS,

- to private property, Interference with, 93, 94.

ACCOMMODATION,

- at another company's stations, Interference with, 64.

ACCOMMODATION WORKS,

- Provisions of General Acts as to, 102.
- Cases as to, 255.

ADDITIONAL,

- Line or sidings laid down by petitioners after promoters' plans deposited, 72.
- Rail, estimate for expense of laying an, 236.

ALLEGATIONS IN PETITION,

- opponents confined to, 11.
- vagueness of, 11.
- Line "ill contrived," 11.
- Line "better defined," 12.

ALTERATION,

- of plans before the Referees, 12.
- must be within limits of deviation, 13.
- may be proposed by either promoters or opponents, 12.
- on plans of bridges and viaducts, 14.
- docks, 15.
- in position of junctions, 16.

ALTERATION—*continued.*

Mutual alteration of gradients, &c. where opposing line not yet constructed, 74.

See GRADIENTS, CURVES, JUNCTIONS, LEVEL CROSSINGS.

of engineering works under General Acts after sanctioned, 29.

one suggested proving impracticable, can another be proposed, 25.

ALTERNATIVE,

lines or routes, Petitioners suggesting, 21.

Recommendation of Select Committee as to, 22.

source of water supply, 289.

AMENDMENT ON PLANS,—see ALTERATION.

ANCHORAGE,

Interference with, 200.

APPEARANCE,

Certificate of, 4.

leaving counsel's name blank in, 10.

APPROACHES,

to another company's station, &c., Interference with, 64.

to private property, Injury to, 93.

ARCH,—See SPAN.

Deviation from line or level of, under General Acts, 29.

Substitution of other engineering works for, under General Acts, 29.

Interference with another company's, 66.

thrown over land, Compensation for, 272.

AUTHORISED LINE,

Interference with an, 74.

BACK SHUNTS,

When objectionable, 132.

Effect on Bill of unfavourable report as to, 42.

BEGIN,

Right to, 5.

Exceptions to rule, 5.

of petitioners *inter se*, 7.

BILL,

Effect on, of Referees' report, 37 *et seq.*

Cases where not proceeded with after adverse report, 38.

BILL—*continued.*

Jurisdiction over whole subject matter by consent, 48.

Referees cannot insert clauses in, 13.

Powers taken by, insufficient for construction of works, 208.

BLIND SIDING,

when objections to junctions remedied by, 135.

BOARD OF TRADE,

objecting to plans of bridge over tidal waters, 14.

Power of, as to sanctioning alteration of gradients, 28.

Power of, as to sanctioning substitution of other engineering works, 28, 29.

Power of, to require bridge instead of level crossing over roads, 162.

Power of, as to deviation of works skirting tidal waters, 30.

Power of, to require opening span, 195.

Power of, to require lights to be exhibited on tidal waters, 204.

Power of, to survey works in tidal waters, 205.

Estimate insufficient if open viaduct required by, instead of embankment, 239.

BOOK OF REFERENCE,

No deviation into lands of persons not mentioned in, 29.

BRIDGES,

Alteration of spans and headways before Referees, 14.

Proposing to use bridges constructed for petitioners' railway, 52.
swinging, Destroying points at, 60.

Span and Headway of, over other lines, 77.

Headway of, under other lines, 80.

obstructing view of signals or of line, 82.

Headway, span, &c., of, over and under private lines and tramways, 101.

Headway, span, &c., of, over and under roads and streets, 173.
over tidal or navigable waters, 189.

Opening, 194.

Powers of Board of Trade to order, 195.

CANAL,

Interference with land of, 87.

Proposed line running close to, 88.
passing under, 88.

Passage of vessels to, interfered with, 99.

CANAL—*continued.*

- Interference with towing paths of, 89.
- Headway and span of bridges over, 90.
- Interference with private, 96.
- Interference with private tramway of, 102.
- Proposed line below level of, 158.

CERTIFICATE OF APPEARANCE,

- to be produced from Private Bill Office, 4.
- Leaving counsel's name blank in, 11.

CARE,

- Referees reporting favourably of engineering, with qualification that care necessary in working, 61, 115, 116, 117, 150, 151.

CHAIRMAN OF REFEREES,

- must be Member of House, 1.

CHAIRMAN OF WAYS AND MEANS,

- to appoint Referees, 1.
- to frame rules for practice and procedure, 3.

CHANNEL,

- Interference with,—see NAVIGATION, SILTING.

CLAUSES,

- Referees have no power to insert, 13.

COLLIERY,

- Interference with tramway to, 101, 102.

COMMITTEE ON BILL,

- Referees' report to stand referred to, 8.

Proceedings before, when estimate reported insufficient, 37.

- when engineering reported objectionable, 39.
- when undue interference with navigation reported, 45.

Power to refer questions arising to Referees, 47.

- may investigate questions of engineering incidentally arising, 48.
- or engineering merits of alternative routes, 48.

COMPARISON,

- of proposed line and others suggested, 21, 30.
- of proposed and some other source of water supply, 289.

COMPENSATION,

- Insufficient provision for, in estimate, 242.
- Where private property interfered with, 243.
- for town property taken, 245.
- for remote injury or contingencies need not be provided, 247, 252.
- for land increased in value since survey, 248.
- No valuation at all made, 249.
- for land on which another line have partially constructed works, 249.
- Taking part of a house, manufactory, &c., 250, 267.
- for intersected lands, 253.
- for temporary use of land, roads, &c., 254.
- Law of, 256.
- for interference with roads and streets, 257.
 - water, 262.
- for vibration, noise, &c., 265.
- for danger to cotton mill through proximity, 267.
- when company tunnel under land, 271.
- for minerals, 273.
- to mill-owners in water, 276.
 - in money, Estimate must be sufficient to cover, 290.

COMPETING LINES,

- Powers of the Referees, 30.
- Instances of, 31.

COMPULSORY POWERS,

- Delay of opponents in taking land now sought by promoters, 57.
- Promoters seeking land, after expiry of petitioners' powers, 57.

CONCESSIONS,

- to opponents, 12.

CONSENT,

- of petitioners to works, Referees' report subject to, 34.
- of parties to jurisdiction over whole subject matter, 48.

CONSTITUTION,

- of the courts, 1.

CONSTRUCTION,

- of petitioners' railway, Preventing or obstructing, 52.
- of proposed works depending on construction of other distinct proposed works, 214.

CONTEMPLATED WORKS,

- of petitioners, objections in respect of, 36, 79.

CONTINGENCY,

- Construction of proposed works dependent on, 214.
- when not necessary to provide for in estimate, 245, 252.

COST OF PRODUCTION,

- Referees to enquire into, of gas, 292.
- Cases, 294, *et seq.*

COUNSEL,

- Speeches of, 7.
- only one heard for each party, 9.
- but more than one may attend, 10.
- Recommendation of Select Committee, 9.

COURTS OF THE REFEREES,

- number and constitution of, 1.

CROSSING,—see LEVEL CROSSING.

CURRENT,

- Construction of docks, increasing velocity of, 220.
- See TIDAL WATERS, BRIDGES.

CURVES,

- Junctions proposed on sharp, 111.
- Instances where allowed, 112.
- Objections remediable within limits of deviation, 116.
- Exceptional cases where such junctions usually allowed, 118.
- Engineering rules as to, 143.
- Objections to sharpness of, on lines, 146.
- Remediable within limits of deviation, 148.

CUTTINGS,

- When tunnels may be made in place of, 28
- no provision in estimate for surplus, 227.
- Rock, estimate for, vague, 231.

CYLINDERS,

- Subway under Thames formed by sunk, 199.
- Cofferdam formed by, 198.

DAMAGE,

- to other lines,—see RAILWAY OPPOSING.
- to private property, no engineering objection, 92.
- Attacking estimates, in such cases, 95, 243.

See PRIVATE PROPERTY.

DANGER,

- to adjacent gunpowder mills, 104.
- to adjacent cotton mills, 267.
- to another railway through landslips, 71.
- to district from floods through insufficient waterway of viaduct over river, 105.
- through proximity of two tunnels, 217.

DECISION,

- of Referees, Effect on Bill of, 37, *et seq.*
- in Water Bills, 291.

DEPOSIT,

- of petitions against, 4.
- of surplus cutting, No provision in estimate for, 227.

DESTRUCTION,

- of another railway's sidings and other works, 58 *et seq.*
- of points at swinging bridge, 60.
- of points at junctions, 69

DEVIATION, LIMITS OF,

- Extent of, 26.
- where works skirting tidal waters, 30.
- Alteration on plans competent within, 12.
- When Referees will recommend restriction of, 67.

DIFFICULTIES IN CONSTRUCTION,

- Country presenting unusual, 150 *et seq.*

DISTRICT,

Interference with drainage of, 105.
danger to, from floods through insufficient waterway of viaduct over river, 105.

DIVERSION,

of street proposed by petitioners, 24.
of road,—see ROADS.
of channels, tide, &c.,—see NAVIGATION.

DOCKS,

Alteration before Referees, of plans of, 15.
Alleged undue interference with navigation, 220.
See NAVIGATION, SILTING.
depriving another dock company of water supply, 220.
Proposed docks reported inefficient, 221.
Dock company seeking powers to supply shipping with water, 221.
Landing passengers by pontoons, 222.
Lock at entrance to dock too small, 222.

DOWN TRAFFIC,

No provisions made for, 209.

DRAINAGE,

of a district, Interference with, 105.
of line below level of stream, 158, 88.
of a town, Tunnel interfering with, 216.
of road lowered below level of adjoining stream, 179.
pipes, Interference with, 184.
of tunnels, 215.

DREDGING,

No provision for, to construct harbour of refuge, 229.

EARTHWORK,

Quantity understated in estimate, 225.
Promoters calculating on getting rubbish gratuitously for same, 227.

ECONOMY,

Referees reporting estimate sufficient with, 240.

EFFICIENCY OF WORKS,
See **ENGINEERING DETAILS,**

ELIGIBILITY
cf other sites, routes, &c., 21, 23, 289.

EMBANKMENT,
Viaduct proposed before Referees instead of, 24.
When viaducts may be constructed in place of, 28.
Interference with slopes of another company's, 76.
obstruction to view of junction caused by, 84, 85.
interfering with private tramway, 99.
across or along tidal waters, 196.
construction of, to reclaim lands from sea, 206,
slopes of similar, in neighbourhood, proved, 239.
estimate reported insufficient if Board of Trade require viaduct in
place of, 239.

ENDORSEMENT,
of petitions against, necessary, 4:

ENGINEER,
of promoters may be called by opponents, 5.
Speaker's order for his attendance, 5.
Referees' report subject to reference to, 33.

ENGINEERING DETAILS,
Jurisdiction of Referees as to, 2.
Powers still possessed by Committee on Bill, 48.
Effect on Bill of adverse report as to, 39.

ENGINEERING WORKS,
Powers to alter after sanctioned, 26.

ENGINE SHED,
Interference with another company's, 58.

ESTATE,—See PRIVATE PROPERTY.

ESTIMATE,
Jurisdiction of the Referees as to, 2.
insufficient, Effect on Bill of report that, 37, 223.
Form of, 224.

ESTIMATE—*continued.*

- Quantities understated in, 225.
No provision in, for junctions, signals, sidings, &c., 225.
nor for stations, where lines mineral, 226.
nor for deposit of surplus cutting, 227.
nor for land for docks, the promoters claiming to be owners, 229.
Larger works to be constructed than on plans, 230.
Different material to be used than contemplated in, 231.
for rock cuttings, Vagueness of, 231.
for whole scheme sufficient, but insufficient for a part, 232.
Portion of line provided for in separate Bill and estimate, 234.
Whether necessary to deposit estimate for laying additional rails, 236.
How dealt with when portion of line abandoned, 236.
Sufficient “with economy,” 240.
Expense of substituting other roads, 240.
gas and water pipes, 241.
Compensation should be provided for in,—see **COMPENSATION**.

EVIDENCE,

- Price paid for land in district, 238.
Price paid for similar work in district, 238.
Slopes of similar embankments in district, 239.

EXISTING WORKS,

- Referees cannot decide on legality of, 35.
Interference with another company's, 58.

EXPENSE,—see **ESTIMATE**.

- entailed on another company through proposed works, 69.

EXTRAORDINARY DIFFICULTIES,

- Country presenting, 150 *et seq.*

FACING POINTS,

- Effect on Bill of adverse report as to, 43.
Objectionable on main lines, 136.
Allowed where speed of trains slow, 140.
junction on level, 140.
Two sets of, on a single, “highly objectionable,” 141.

FILTRATION,

of sea water under embankments constructed to reclaim lands, 206.

FLOODS,

danger to district through, caused by insufficient waterway, 105.

FORESHORE,

Promoters claiming ownership of, 35, 229.

GAS BILLS,

Jurisdiction of Referees as to, 2, 292.

Power of Referees to enquire into engineering details, 292.
in past sessions, 294 *et seq.*

Illuminating power, supply, pressure, price, &c., 294 *et seq.*
Cases in which all questions submitted to Referees, 298.

GAS PIPES,

Interference of railway with, 184.

Expense of substituting other, to be provided for, 241.

GATES,

to be erected at level crossings over roads, 161.

GAUGE,

proposed junction of broad with narrow, and *vice versa*, 131.

GENERAL ACTS,

Petitioners' objections may be obviated within powers of, 16.

Provisions of, as to powers of deviation and alteration of engineering works, 27—30.

Provisions of, as to headway and span over other lines, 77.

headway under other lines, 80.

Accommodation Works, 102.

junctions, 107.

crossing roads and streets on level, 160.

altering inclination of roads and streets, 169.

headway, &c., of bridges, under and over road, &c., 173.

screens for turnpike roads, 177.

interference with gas, water, &c., pipes, 184.

bridges over tidal or navigable waters, 189.

works in same, 203.

G1RDER BRIDGE,

Junction proposed on, 17.

GOODS STATIONS,

Interference with another company's, 60, 64, 73.

GRADIENTS,

Deviation from, allowed by General Acts, 28.

of other lines, proposed works disturbing, 77, 80.

Junctions on irreconcileable, 108.

on steep, 111.

no level space for standage, 111.

Instances where junctions on steep, allowed, 112.

objections remedied within limits of deviation, 116.

exceptional circumstances in which such junctions usually allowed, 118.

Engineering Rules as to Gradients generally, 143.

Table of Gradients, 145.

Steepness of Gradients on Line, 146.

when remedied within limits of deviation, 148.

Lines through country of extraordinary difficulty, 150.

Stations on or near to steep, 156.

of roads and streets, alteration of, 169.

Cases where power sought to alter, 170.

Cases where such powers omitted to be sought, 171.

in tunnel, 215.

GUNPOWDER MILLS,

Endangering, through proximity of line, 104.

HARBOUR,—see Docks.

No provision in estimate for dredging, to construct, 229.

HEADWAY,

Alteration of, from height originally proposed, 14.

over other lines, 77.

under other lines, 80.

over canals, 90.

over and under private tramways, 101.

over and under roads and streets, 173.

HEADWAY—*continued.*

over tidal or navigable waters, 189, 196.
of tunnels, 215.

HIGHWAYS,—see **ROADS**.

Level crossings over, 161.

HOUSE,

Taking part of a, 250, 267.

HOURS OF MEETING,

of the Referees, 4.

ILLUMINATING POWER,

of gas, 294 *et seq.*—see **GAS**.

IMPERILLING,

another line through danger from slips, &c., 71.

IMPRACTICABILITY,

of junctions,—see **JUNCTIONS, GRADIENTS**.

Effect on Bill of report of, 42.

IMPROVEMENT BILL.

Reclamation of lands, 206.

Street improvements, 187, 245, 246—7.

Width of a proposed new street in metropolis, 187.

INCLINATION,

of roads and streets, provisions of General Acts as to, 169.

Cases where powers sought to alter, 170.

Cases where promoters omitted to seek power to alter, 171.

of slopes of embankments, 239.

INCOMPATIBILITY,

of gradients,—see **GRADIENTS**.

remediable by mutual alteration where petitioners' line not yet constructed, 74.

of levels, 75, 125.

INDIVIDUALS,—see **PRIVATE PROPERTY**.

Injury to, through shutting up public street, 95.
through deprivation of water supply, 276.

LAND,

Legality of promoters' claim to ownership of, 35.
of another company, Proposing to take, 50 *et seq.*
Land intended for another company's station, 50.
for doubling petitioners' line, 52.
for petitioners' sidings, 55.
But where petitioners have delayed to use, 56.
or their compulsory powers have expired, 57.
Land which another line authorised to take, 57.
of canal company, Proposing to take, 87 *et seq.*
of private individuals and companies, 92 *et seq.*
 Damage to, not engineering objection, 92.
 Residential damage, 93, 94.
 Injury to approaches to land, 93.
 to private road or sewers, 94.
Accommodation Works, 102, 255.
Tidal, Works on, 189 *et seq.*
None provided for stations, standage, &c., 208—211.
nor for deposit of surplus cutting, 227.
Price paid for similar land in district, Evidence, 238.
Value of, in towns, 245.
increased in value since estimate made, 248.
no actual valuation of, made for estimate, 249.
value of, on which another railway have partially constructed
works, 249.
Deducting value of surplus, from estimate, 252.
Intersected, 253.
Compensation for temporary use of, 254.
Law of Compensation regarding injury to,—see COMPENSATION.

LATERAL DEVIATION,

Powers of, under General Acts, 28 *et seq.*

LEGALITY,

of existing works, Court cannot decide as to, 35.
of promoters' claim to ownership of land, 35.

LEVEL,

Incompatibility of, at proposed points of junction, 125.
Facing points allowed where junction on, 140.
of adjacent river or canal, line below, 158.
Deviation from levels on plans, 27, 29,

LEVEL CROSSING (OVER RAILWAYS),

- over another company's line proposed, 61.
- over an abandoned line, 62,
- where speed of trains slow, 62.
- where lines mineral, 63.
- over local lines to join main lines, 127—129.
- over main lines, 127—129.
- over private tramways, 98, 99, 100.

LEVEL CROSSING (OVER ROADS AND STREETS),

Provisions of General Acts on this subject, 160.

- Must be specially authorised, 160.
- Gates to be erected, 161.
- Speed of trains at crossings near stations, 161.
- Over bridle-ways and footways, 161.
- Shunting trains over, 161.
- Bridge may be required by Board of Trade, 162.
- over roads, 162.
 - close to one already existing allowed, 162.
 - not used with wheels, 162.
 - or with little traffic, 163.
 - additional line of rails allowed, 163, 167.
 - Petitioners proposing bridge instead of, 163.
 - or a diversion instead of, 164.
 - 73 proposed by one Bill, 165.
 - allowed where near stations, 168.
- over streets, 165.

LIGHTS.

Exhibition of, on works in or across tidal or navigable waters, 204.

LIGHTHOUSES,

Their safety protected in Reclamation Bill, 207.

LIMITS OF DEVIATION,—see DEVIATION.

Alterations or amendments to be within, 12.

Extent of, 26.

Alternative lines beyond, 21.

Alternative sites beyond, 23.

when will be restricted, 67.

LINE,

deviation from, allowed by General Act, 26.
Preventing doubling of another company's, 52.
view of, obstructed, 82.
alternative proposed by petitioners', 21.
alteration on petitioners', after promoters' plans deposited, 72.
Private, Interference with, 96—102.
Local, crossing same on level to join main lines, 127—9.

LOCK,

Objections to dimensions of, 15, 222.

LOWERING LINE,

Preventing opposing company from hereafter lowering their line, 70.

MAIN LINES,

Promoters' trains standing on petitioners', 68.
or blocking same, 68.
Junctions with crowded, 126.
 in general objectionable, 126.
 not so when with promoters' own line, 128.
 nor where line joined has complete control of signals, 130.
Crossing main lines on level, 126.
Crossing local lines on level to join main lines, 127—9.
Facing points on, objectionable, 136.
Secus if where speed slow, 140.
 or Junction on level, 140.
Two sets on a single line, highly objectionable, 147.
See JUNCTIONS, BLIND SIDING, BACK SHUNTS.

MANUFACTORY (PRIVATE),

Interference with, 95, 244, 245, 250—252.
Proposal to take part of a, 250.
Law of Compensation as to taking part of a, 267.

MATERIAL,

Different material proposed to be used from that contemplated in estimates, 231.

MILLOWNERS,

- Objections to Water Bills by, 276.
- Water and money Compensation to, 276 *et seq.*
- Water compensation usually one-third of rainfall, 278, 279, 281.
- No compensation reservoir provided, 280.
- Estimate must be sufficient to cover money compensation, 290.

MILL,

- danger to, through proximity of line, 104.
- Compensation for such proximity, 267.
- Interference with private property intended "for mills and wharves," 93.

MINERAL LINES,

- Level crossings over, 63.
- Level crossings over private, 98, 99, 100.
- Junctions with, 123.
- Objection that no provisions for stations on, 211, 226.

MINERALS,

- Compensation for, under line, 273.

MODIFICATIONS,

- on plans before Referees,—see ALTERATION.

MOORY GROUND,

- Line proposed through, 150.

MULTIPLICITY OF JUNCTIONS,

- at the same place, 123.

NAVIGATION,

- Deviation of railway skirting tidal waters, 30.
- Effect on Bill of adverse report as to Interference with, 45.
- Bridges or viaducts over navigable waters, 189.
 - Provisions of General Act as to headway and span, 189.
 - Schemes of past Sessions, 190—196.
 - Vessels having to lower top-gallant masts to pass under bridge, 191.
 - Opening bridges, 194.
 - When Board of Trade may require opening spans, 195.
- Embankment along or across navigable rivers, 196.

NAVIGATION—*continued.*

- Tunnels under navigable waters, 197.
- Limiting time during which bed of river to be occupied, 199.
- Tunnel under canal, 199.
- Sinking cylinders in navigable river to form subway, 199.
- interfering with anchorage ground, 200.
- Silting up of sand, 200.
- Dock or pier interfering with, 202.
- Provisions of General Act as to works in navigable rivers, 203.

NOISE,

- Whether compensation claimable for, caused by locomotive trains, &c., 265.

NOTICE,

- of hearing before Referees, 4.

OBJECTIONS,

- Petitioners restricted to those alleged in petition, 11,
vagueness of, 11.
- that proposed line “ill-contrived,” 11.
- that petitioners’ line “better defined,” 12.
- in respect of works contemplated by petitioners, 36, 55, 79.

OBVIATING OBJECTIONS,

- Competent within limits of deviation, 12, 25.
- by mutual alteration where petitioners’ line not yet constructed,
74.

OBSTRUCTION,

- to navigation,—see NAVIGATION.
- to view of signals or of line, &c., 82—86, 218.

OPENING BRIDGE,

- over tidal or navigable waters, 194.
- Provisions of General Acts as to, 195.
- When Board of Trade may require, 195.

OPPONENTS,—see PETITIONERS.**ORDER OF CASES,**

- in which heard, 4.

OVERBRIDGE,

obstructing view of signals or of line, &c., 82—86.

interfering with sidings, line, &c.—see SIDINGS, RAILWAY OPPOSING.

OWNERSHIP,

of land, &c., legality of promoters' claim to, 25, 229,

PASSAGE,

of vessels, Interference with,—see NAVIGATION.

to Canal, 89.

PATHS,—see TOWING PATHS.**PETITION,**

deposit of, endorsed, 4.

Petitioners confined to allegations in, 11.

PETITIONERS,

Right to begin *inter se*, 7.

restricted to allegations in petitions, 11.

proposing alteration on plans as deposited, 12 *et seq.*

Consent of, Referees' report subject to, 34.

PIER,

Preventing construction of tramway at, 97.

interfering with navigation, 202, 221.

PLANS,

Alterations on, as deposited, 12 *et seq.*

Deviation from, allowed by General Acts, 26 *et seq.*

POINTS,

Facing,—see FACING POINTS.

Destruction of, at swinging bridge, 60.

Destruction of, at junctions, 69.

PONTOON,

Dock company proposing to land passengers by means of, 222.

POWERS,

of Board of Trade,—see BOARD OF TRADE.

taken by Bill insufficient for construction of efficient works, 208
et seq.

Effect on Bill of report thereof, 44.

of vertical and lateral deviation, 26 *et seq.*

of Referees,—see JURISDICTION.

PREFERABLE,

- route for line, 21.
- source of water supply, 289.

PRESSURE,

- of water, 288.
- of gas, 297.

PREVENTING,

- doubling of petitioners' line, 52.
- extension of petitioners' sidings, 55.
- lowering of petitioners' line, 70.
- petitioners' using running powers over another line, 70.

PRICE,

- of gas, 294 *et seq.*

PRIVATE PROPERTY,

- Interference with, 92 *et seq.*

- not an engineering objection, 92.
- residential damage, 93, 94.
- injury to approaches to land, 93, 94.
- land laid out for mills and wharves, 93.
- private road, 94.
- private sewers, 94.
- Works of a manufactory, &c., 95, 244, 245, 250.
- When estimates should be challenged, 95, 243.
- Destroying private canal, 96.
- private tramways and sidings, 96, 98, 99.
- not an engineering objection, 96.

Unnecessary or avoidable interference with private property, 98.

What if private sidings interfered with are on promoters' own land, 100.

Crossing private lines on level, 98, 99, 100.

Headway, span, width, &c., of bridges over and under private lines, 101.

Accommodation works, 102, 255.

 Provisions of General Act as to, 102.

 Cases as to, 255.

Endangering private gunpowder mills by proximity of lines, 104, 267.

Where private property interfered with, petitioners should attack estimates rather than engineering details, 243.

 See COMPENSATION. LAND.

PROCEDURE,

- Chairman of Ways and Means to issue Rules of, 3.
- Rules issued by him, 3.
- Right to begin, 5.
- Rights *inter se* of petitioners to begin, 7.
- Course of procedure at hearing, 7.
- One counsel on each side, 9.
- Opponents restricted to allegations in petition, 11.
- Alterations and modifications within limits of deviation, 12. See
ALTERATION.
- Competing lines, 30.

PROJECTED LINE,

- Interference with a, 74—77.

PROMOTERS,

- Their engineer may be called by opponents, 5.
- Speaker's Order for his attendance, 5.
- Right to alter plans before Referees, 12 *et seq.*

PROPERTY,—see PRIVATE PROPERTY.**PROPOSED LINE,**

- Interference with a, 74—77.

PROXIMITY,

- of line to petitioners' railway, 52, 55, 217.
- to canals, 88.
- to roads,—see ROADS.
- to gunpowder mills, 104.
- of two tunnels, 217.
- to cotton mill, compensation for, 267.

PURITY,

- of gas, 292, 294—297.

QUALITY OF GAS,

- Jurisdiction of Referees as to, 292.
- Objections as to, 294—297.

QUALITY OF WATER,

- Jurisdiction of Referees as to, 274.
- Objections as to, 286.
- Preferable source of supply, 289.

QUANTITIES,

understated in estimate, 225.

See **ESTIMATE.**

QUAY,

Cutting off communication between petitioners' railway and a, 71.

QUESTION,

arising before Committee and submitted to Referees, 26, 47.

such questions may be investigated by Committee, 48.

RADIUS OF CURVES,

how far may be diminished under General Act, 28.

Objections to sharpness of,—see **CURVES.**

RAILWAY (OPPOSING).

Interference with property, rights, &c., of, 50 *et seq.*

Interference with land of, 50.

Taking land intended for another railway's station, 50.

for doubling opponents' line, 52.

for opponents' sidings, 55.

Neglect or delay of opponents to use the land, 56.

Taking land which opponents authorised to take, 57.

Opponents' compulsory powers expired, 57.

Interference with another company's existing sidings, 58.

Destroying points at swinging bridge, 60.

Crossing another company's line on level, 61.

See **LEVEL CROSSING.**

Interference with another company's station arrangements or approaches, 64.

or with arch constructed by them, 66.

When promoters' powers of deviation will be restricted, 67.

Promoters' trains standing on petitioners' main line, 68.

Destroying petitioners' junction points, 69.

Entailing expense on petitioners without countervailing advantage, 69.

Preventing petitioners from lowering their line, 70.

Preventing petitioners from using running powers over another line, 70.

Cutting off communication between petitioners' line and quay, 71.

RAILWAY (OPPOSING)—*continued.*

- Causing danger to petitioners' line from land-slips, 71.
Where condition of petitioners' line altered subsequently to deposit of plans, 72.
Interference with authorised railway, 74.
 proposed railway, 74.
Headway and span over other lines, 77.
Disturbing gradients of other lines, 77, 80.
Headway under other lines, 80.
Obstruction caused to view of signals, line, or station, 82.
See also JUNCTIONS, GRADIENTS, CURVES, TUNNELS, FACING POINTS, BACK SHUNTS, BLIND SIDINGS.

RAINFALL,

- Water compensation to millowners usually one-third of, 278, 279, 281.

RECLAMATION,

- of tidal lands, 206 *et seq.*

REFEREES,

- Powers of,—see JURISDICTION.
Chairman of, 1.
Number of, and number of courts, 1.
Their report, 8.
stands referred to Committee on Bill, 8.
Effect of their report on Bill, 8, 37, 291.
Question referred to, by Committee, 47.
All questions may be referred to, 48.

REFERENCE,

- by Referees to Engineers to settle alteration on plan to obviate objections, 33.

REMOVAL,

- of point of junction from position on plan, 16.

REPORT OF REFEREES,—see REFEREES.**RESERVOIR (COMPENSATION),**

- No provision for, an objection, 280.

RESIDENTIAL DAMAGE,—see PRIVATE PROPERTY.

RESTRICTION,

- of promoters' powers of deviation, 67.
- of waterway,—see NAVIGATION.

RIGHT TO BEGIN,

- Rule as to, and exceptions, 5.

RULES,

- for Practice and Procedure of the Courts, 3.

RIVER,

- Insufficient waterway over, danger to district from floods, 105.
- Objection that line below level of, 158.
- Proposing to lower road below level of, 179.
- Tunnels under, 197.
- Works in navigable,—see NAVIGATION.
- Subway under Thames, 199.
- not navigable, Power to alter course of, 205.
- Insufficiency of estimate for tunnel under, 228.
- Compensation for interference with, 262.

ROAD,

- Better route suggested by petitioners, 22.
- Interference with private, 94.
- Interference with public, 160 *et seq.*
- Crossing roads on level,—see LEVEL CROSSING.
- Altering inclination of roads, 169.
 - Provisions of General Act as to, 169.
 - Instances where powers sought to alter, 170.
 - Instances where such powers omitted to be sought, 171.
- headway, span, width, &c., of bridges over and under roads, 173.
- screens for turnpike, 177.
- Lowering, below level of stream, 179.
- Site of, proposed to be occupied by line, 180.
 - See STREET.
- Expense of substituting other roads should be provided for in estimate, 240.
- What compensation for interference with, 257 *et seq.*

ROCK CUTTINGS,
Estimate for, 231.

ROUTE,
Alternative proposed, cannot be considered, 21.
Recommendation of Select Committee on Referees
as to, 22.
for road, 22.

RUBBISH,
Promoters calculating on getting, gratuitously for earthwork, 227.

RUNNING POWERS,
Preventing petitioners' using such powers over a third line, 70.
Promoters not taking, over piece of another line necessary to
effect intended junction, 212.

SAND,
Possible silting up of, 200, 220.
unstable nature of, Impossibility of constructing embankment,
206.

SCREENS,
for turnpike roads, 177.

SELECT COMMITTEE ON REFEREES,
Their recommendation as to number of counsel, 10.
as to alternative lines, 22.
as to competing lines, 30.

SELECT COMMITTEE ON BILL,—see COMMITTEE.

SERVICE,
in Waterworks Bills, Jurisdiction of Referees as to mode of, 274.
Cases, 283, 288.

SEWER,
Interference with private, 94.
with public, 184, 215.

SHARPNESS OF CURVES,—see CURVES.

SHORE—see FORESHORE.
Access to, over or under railway, 204.

SHUNTS,—see BACK SHUNTS.

SIDINGS,

Legality of existing, questioned, 35.

contemplated by petitioners, Objections in respect of, 36, 55, 79.
taking land intended by another company for, 55, 56.

Interference with another company's existing, 57.

New, laid down subsequently to deposit of plans, 72.

private, Interference with, 96 *et seq.*

when on promoters' own land, 100.

Blind, 135.

No provision for, by Bill, a defect, 208.

No provision for, in estimates, 225.

SIGNALS,

Obstruction to view of, 82, 218.

at junctions, by whom erected and controlled, 107.

at junctions, Expense by whom borne, 107.

at junctions entirely under control of line joined, effect of, 120.

Tunnels obstructing view of, 218.

No provision for in estimate, 225.

SILTING UP,

of sand, &c., Objections on account of, 200, 220.

SINGLE LINE,

Preventing doubling of petitioners', 52.

Promoters proposing to double petitioners', 249.

Two sets of facing points on a, "highly objectionable," 141.

SITE,

of docks altered when before Referees, 15.

alternative or superior, suggested for docks, 23.

of petitioners' authorised station, Promoters proposing to change,
76.

of road proposed to be occupied, 180.

SITTINGS,

of the Referees, 4.

SLIPS, LAND,

Danger caused to another line, through, 71.

SLOPES,

of embankment,—see EMBANKMENT.

SLOWNESS,

Speed,—see SPEED.

SPAN OF BRIDGES,

Alteration of width from that originally intended, 14.

over other lines, 77

over canals, 90.

over private lines and tramways, 101.

over roads and streets, 173.

over tidal or navigable waters, 189.

opening, over tidal waters, 194, 195.

SPEAKER OF HOUSE,

Referees appointed by, 1.

His order for attendance of promoters' engineer, 5.

SPEECHES,

of counsel, 7.

SPEED OF TRAINS,

Level crossings where slow, 62.

Junctions on steep gradients and sharp curves, where slow, 121.

Facing points, where slow, 140.

not to exceed 4 miles an hour at level crossings near stations, 161.

SPOIL,

No provision made for deposit of surplus, 227.

STANDAGE,

for trains at stations, Interference with, 66.

at points of junction not provided, 111, 208.

at stations, No provision for, 208.

STANDING ORDER,

No. 45, 223.

No. 90, 1, 9.

No. 91, 3.

No. 92, 2, 274, 292.

No. 93, 2.

No. 94, 48.

No. 95, 8.

STANDING ORDER—*continued.*

No. 96—37.

No. 97—47.

STATION,

Taking land intended by another company for, 50, 57.

Interference with another company's existing, 64.

Promoters proposing to change site of petitioners' authorised, 76.

Obstructing view of signals at, 82, 218.

Junctions on steep gradients or sharp curves near to, 121.

with crowded main lines near to, 126 *et seq.*

Gradients at, engineering rule, 144.

on or near to steep gradients, 156.

Level crossings over roads near to, 168.

120 feet below level of adjoining street, 187.

No provision in Bill to erect or use, 208—211.

This no objection where line mineral, 211, 226.

Tunnels close to, 218.

STEEPNESS,

of gradients,—see GRADIENTS.

STORAGE,

in Water Bills, 283—286.

reservoirs, Provision for inadequate, 281.

STEAM,—See RIVER.

STREET,

Petitioners proposing that promoters should divert, 24.

Injury to individuals through shutting up public, 95.

Interference with, 160 *et seq.*

Crossing on level,—LEVEL CROSSING.

Altering inclinations of, 169.

Provisions of General Acts, 169.

Instances where powers sought to alter, 170.

where promoters omitted to do so, 171.

Headway, span, width, &c., of bridges under and over, 173.

Screens, 177.

Shutting up, Providing new street, 180.

Gas and water pipes under, Interference with, 184, 241.

Proposing to lay tramway in a narrow, 185.

STREET—*continued.*

- Width of a new, in metropolis, 187.
- Proposed station 120 feet below, 187.
- Compensation arising from interference with, 257 *et seq.*

SUBWAY,

- under Thames, 199.

SUPPLY,

- in Water Bills, 274.
See WATER.
- in Gas Bills, 292.
See GAS.

SURPLUS CUTTING,—see CUTTING.**SWINGING BRIDGE**,

- Destroying points at, 60.
- in crowded thoroughfares, 186.

TESTING,

- Gas, 294 *et seq.*

TEMPORARY USE,

- of land, roads, &c., Compensation for, 254.

TIDAL WATERS,

- Deviation of works skirting, 30.
- Effect on Bill of adverse report as to interference with, 45.
- Bridges or viaducts over, 189.
- Vessels compelled to lower top-gallant masts, 191.
- Opening bridges over, 194.
- Embankment across or along, 196.
- Tunnels under, 197.
- Subway under, 199.
- Interference with anchorage ground, 200.
- Possible silting up of sand, 200.
- Pier, 202.
- Provisions of General Act as to works in, 203.
 - Board of Trade may require lights, 204.
 - may survey works, 205.
- Reclamation of tidal lands, 206.
- Lighthouses protected, 207.

TOP-GALLANT MASTS,

Vessels being compelled to lower, under bridge, 191.

TOWING PATHS,

of canal, Interference with, 89.

Compensation for destroying profit of, 264.

TOWN,

Estimate for property taken in, 245 *et seq.*

TRAFFIC,

No provision for down, 209.

TRAMWAY,

Private, Interference with, 96, 98, 99, 220.

Headway over or under, 101.

Proposing to lay in a narrow street. 185.

TURNPIKE,—see ROADS.**TUNNEL,**

When may be made in place of cuttings, under General Acts, 28.

Deviation from line or level of, 29.

Substitution of other engineering works for, under General Acts, 29.

Junction near mouth of, 85.

under canal, 88.

Junction in, 130.

under rivers, tidal waters, &c., 197.

Ventilation, gradients, headway, drainage, &c., of, 215.

Proximity of two, 217.

close to junctions or stations, preventing view of signals, 218.

under river, Estimate for, proved insufficient, 228.

under land, whether promoters compellable to take surface and buildings, 271.

VAGUENESS,

of petitioners' objections, 11.

of evidence as to estimate, 231.

VALUE,—see COMPENSATION.**VENTILATION,**

of tunnels, 215.

VERTICAL DEVIATION,
allowed by General Act, 27.

VESSELS,
Interference with passage of, to canals, 89.
obliged to lower top-gallant-masts under bridge, 191.
See NAVIGATION.

VIADUCT,
alteration of spans, proposed before Referees, 14.
proposed by promoters in place of embankment, 24.
when may be made in place of embankment under General
Act, 28.
Deviation from line or level of, 29.
Substitution of other engineering works for, under General Acts,
29.
over tidal or navigable waters, 189—196.
See NAVIGATION.
Estimate insufficient if Board of Trade should order, instead of
solid embankment, 239.

VIBRATION,
Whether compensation claimable for, 265.

VIEW,
of station, signals or line, Obstruction of, 82.

VOTING,
Mode of, by Referees, 4.

WATCHMAN,
may be appointed at junctions by Line joined, at expense of com-
pany joining, 107.

WATER,
pipes, Interference of proposed line with, 184, 241.
Expense of substituting others to be provided for, 241.
Dock company seeking powers to supply Shipping with, 221.
Compensation for interference with, 262, *et seq.*
subterraneous water, whether claimable, 264.
bills, Extent of Referees' jurisdiction, 274.
Depriving millowners and individuals of supply, 276 *et seq.*
Water compensation usually one-third of rainfall, 278, 279,
281.

WATER—*continued.*

- Money compensation, estimate must be sufficient for, 290.
- Objections to proposed supply and storage, 283.
- Objections to quality, 286.
- Pressure, 288.
- Preferable source of supply, 289.
- Effect on Bill of adverse report, 291.

WATERWAY,

- of private canal, destruction of, 96.
- of viaduct, danger to district from floods through insufficiency of, 105.
- narrowing, through construction of docks, 220.

See NAVIGATION.

WHARVES,

- Interference with land laid out for, 93.
- Compensation for cutting off communication between, and river, 263.

WIDENING,

- of petitioners' viaduct, rendering same impossible, 53.

WITHDRAWAL,

- of Bill in consequence of adverse report of Referees, 38.

WITNESS,

- Examination and cross-examination of, 7.
- Promoters' engineer may be called as a, by petitioners, 5.

WORKS,

- Alteration of, after sanctioned, 26.
- Legality of existing, 35.
- contemplated by petitioners, Objections in respect of, 36, 55, 79.
- inefficient, Effect on Bill of report that, 39.
- Interference with another company's existing,—see RAILWAY OPPOSING.
- private, Interference with, 95, 98, 101.
- Price paid for executing similar, in neighbourhood, 238,



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